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COMPUTERWORLD

64-bit boxes lift HP Unix

By Craig Stedman

Racing to regain the high ground on Unix performance, Hewlett-Packard Co. this month will start limited shipments of 64-bit hardware. The move should more than double the speed of its workstations and servers.

HP's 64-bit PA-8000 microprocessor will appear in a new high-end workstation later this month, according to sources familiar with the company's plans. The chip will be available by midyear as an upgrade for HP 9000 workstations. It will be plugged in to HP servers during the second half of the year.

The upgrade-oriented rollout will go easy on HP's installed base by letting customers hold on to their boxes, users and analysts said.

"If I can bring the system down on a weekend and do a board swap, that's a big advantage over transferring my data to a new server and running them in parallel for a couple weeks just to make sure nothing breaks," said Dwight Wolfe, manager of Unix systems at the Personal Lines division of CNA Insurance Cos. in Chicago.

HP's desktop C-class and deskside J-class work-

Hewlett-Packard, page 109

DEC rides NT

Firm drives midrange AlphaServer into enterprise

By Jaikumar Vijayan

Digital Equipment Corp. plans to ride the popularity of Microsoft Corp.'s Windows NT deeper into the enterprise next month with a powerful midrange AlphaServer code-named Rawhide, *Computerworld* has learned.

The AlphaServer 4100 line will plug a gap between Digital's low-end 2100 series and its top-end 8200 and 8400 Turbo-Lasers.

"It is just what we are looking for. We feel like the 2100 will not be able to support our main users much longer," said Fernando Yson, systems manager at Cost Care, Inc. in Huntington Beach, Calif.

Digital, based in Maynard, Mass., refused to comment on unannounced products.

Cost Care is migrating several of its medical review applications to an Oracle Corp. database and is looking for a system that will "accommodate a whole lot of memory," Yson said.

Rawhide's key performance feature is its ability to bring Very Large Memory tech-

Digital, page 109

AlphaServer 4100

MAIN MEMORY
Up to 8G bytes

STORAGE
More than 8T bytes

SYMMETRICAL MULTIPROCESSOR SUPPORT
Up to four processors

OPERATING SYSTEMS SUPPORTED
OpenVMS, Digital Unix, Windows NT

SPECIAL FEATURE
64-bit Very Large Memory

STARTING PRICE
Around $60,000

Collabra users track Netscape

By Kim S. Nash

Netscape's plan to tuck features from Collabra's Share groupware into its forthcoming Internet-based groupware — but not to merge the two products — has Collabra users worried they're being left behind.

Netscape Communications Corp. has laid low with its groupware plans since it acquired Collabra Software, Inc. last November. But the company recently invited 20 large Collabra customers to its headquarters in Mountain View, Calif., for an update.

"They bought Collabra not so much because they like [Share], but they wanted to take Collabra's ideas and retrofit them to the Internet," said Geoffrey Teekema, a groupware project manager at Boston Scientific Corp. who attended the meeting.

Steve Richard, a Share product manager at Netscape, confirmed the company's plans. "We're not

Collabra, page 109

WHAT'S INSIDE

- Microsoft and IBM offer operating system updates. See stories, page 6, by *Bob Francis and Laura DiDio.*
- IBM lays out Tivoli integration plans. See stories, page 8, by *Patrick Dryden.*
- Networld/Interop coverage continues on pages 14 and 15 as users such as UPS' Marc Dodge (right) struggle to find Web tools.
- A new professional group aims to help webmasters. See story, page 67, by *Kim S. Nash.*

Laptops pushing PCs off corporate desktop

By Mindy Blodgett

The dominance of desktop PCs in corporate settings is on the wane. And portables will rise to take their place for mid- to upper-level users by the end of the century, industry observers say.

"Laptops are changing the scope of computing and the way we work today," explained Stephen Wittner, network manager at Centex Group, Inc. in Dallas. "To stay competitive, you have to stay as mobile as possible."

Furthermore, users say that while notebooks can improve productivity, that benefit is difficult to quantify. "Notebooks still cost more, but the productivity gains are there," Wittner said. "Being able to take your work with you — and not need a bulky briefcase — makes a big difference."

The number of workers using portables will expand from about one in five today to one in three by the year 2000, predicted William Ablondi, an analyst at Giga Information Group in Cambridge, Mass. And of those portable users, Giga predicts, 80% will use notebooks as their primary PC, up from the current 30%.

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Data 'wearhouse' gains

Victoria's Secret to weave profits from store data

By Michael Goldberg and Jaikumar Vijayan

Victoria is revealing some new secrets with the help of a data warehouse.

In what observers said is a classic case of value gained by analyzing data in new ways, Victoria's Secret Stores has embarked on a $5 million data warehousing project that its information systems and business managers say will benefit the bottom line.

"We were spending way too much time trying to find information and not enough time analyzing it," said Rick Amari, vice president of IS at

Victoria's Secret, page 16

Victoria's Secret *uses a data warehouse to track demand store by store*

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Inside Computerworld

April 8, 1996

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AT&T Paradyne this week will announce a server plug-in card that could bring affordable voice/data conferencing to the user masses.

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Bowing to IS managers' concerns, Microsoft will integrate its Windows operating systems on several levels, company executives told a user conference.

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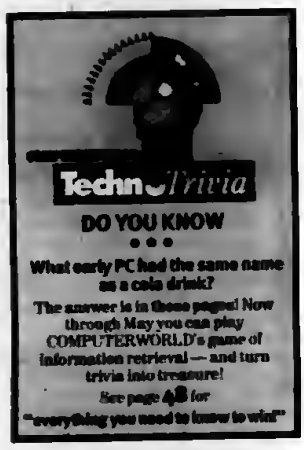
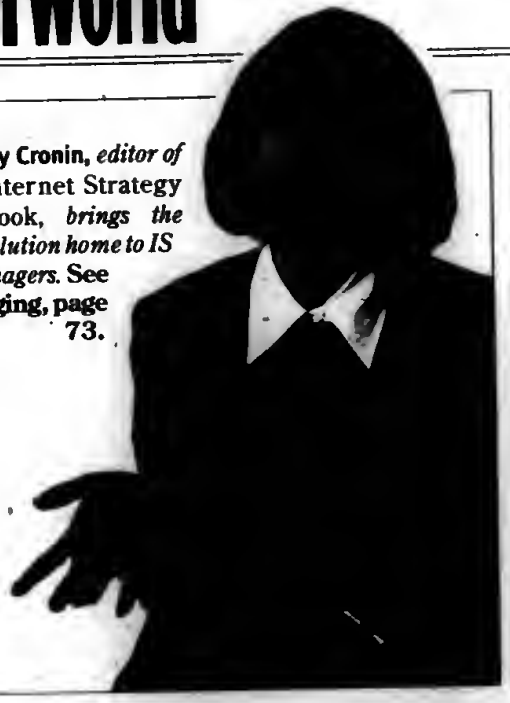


Choice Cuts

Lab tests of six leading Web browsers reveal that none is perfect, although Attachmate's Emissary makes a surprisingly good showing. See **The Internet, page 68.**

Mary Cronin, *editor of* The Internet Strategy Handbook, *brings the Web-olution home to IS managers.* See **Managing, page 73.**



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Not your father's Cadillac

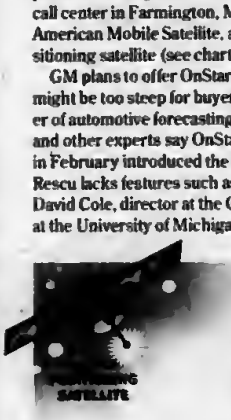
General Motors last week demonstrated a set of "smart car" technologies it will offer to 1997 Cadillac buyers this fall as a $1,000 option.

The OnStar communications system is an example of how the Detroit auto maker is incorporating information technology in its products to gain competitive advantage in the luxury car market.

OnStar has advanced features that would make George Jetson proud. For example, emergency medical services are automatically notified when the vehicle's air bag inflates. The system features a voice-activated cellular telephone from Hughes Electronics that links the car and driver to GM's OnStar call center in Farmington, Mich. The communications links are made by American Mobile Satellite, and the vehicle is located via a Rockwell global positioning satellite (see chart below).

GM plans to offer OnStar in other models in 1998, but the $1,000 price tag might be too steep for buyers of midsize cars, says Ron Clogg, senior manager of automotive forecasting at J. D. Power and Associates in Detroit. Clogg and other experts say OnStar has put GM ahead of its smart-car rivals. Ford in February introduced the Rescu system for its Lincoln Continental. But Rescu lacks features such as theft detection and stolen-vehicle tracking, says David Cole, director at the Office for the Study of Automotive Transportation at the University of Michigan in Ann Arbor. — *Thomas Hoffman*

How it works



- Roadside assistance
- Emergency services
- Routing and location assistance
- Air bag deployment notification
- Remote door unlock
- Theft detection/notification
- Stolen-vehicle tracking

Buzzwords

Brochureware: Web sites that offer static marketing data and no interactivity.
Business process outsourcing: The transfer of ownership and management of a business process to another company.
Data outhouse: A data warehouse with dirty data (inconsistent and inaccurate information). Needs data scrubbing and data cleansing.
George Carlin software: Bounces electronic-mail messages that contain forbidden words back to the sender.
Netsploitation flick: Hollywood films (such as *The Net* and *Hackers*) about the big, scary Internet.
Shoulder surfers: Thieves who look over the shoulder of people entering personal identification numbers or passwords.

■ **Send contributions of offbeat news, lists and anecdotes to mbetts@cw.com.**

The Spectrum 3-D Wireless RingMouse from Kantek in East Rockaway, N.Y., uses ultrasonic and infrared signals to move a cursor across a PC screen. The device is worn on a finger, so the user literally points and then clicks a button to execute commands. The product costs $99. It can be used simultaneously with a standard mouse or can emulate a joystick for 3-D games.

Jobs ranked by stress

The folks who came up with this ranking never had to work around-the-clock on a software project that was two months behind schedule, with users constantly asking for changes and the chief information officer's job on the line.

Job	Stress score
[illegible]	[illegible]
Firefighter	110.936
Surgeon	[illegible]
Police officer	93.893
Air-traffic controller	83.138
Airplane pilot	68.727
Teacher	51.003
Undertaker	46.982
Garbage collector	42.760
Market research analyst	42.060
Technical writer	36.506
Electrical engineer	36.448
Ticket agent	36.195
Secretary	34.238
Philosopher	30.497
Bartender	30.352
Bank teller	30.120
Waiter/waitress	28.944
Maid	28.418
Computer operator	28.230
Telephone operator	26.993
Computer programmer	26.508
Cosmetologist	25.944
Computer service technician	25.817
Dishwasher	25.326
Cashier	25.117
Software engineer	25.000
Barber	23.621
Bookkeeper	21.462
Janitor	16.320

Among the criteria used for scoring: overtime, quotas, deadlines, competitiveness, physical demands, environmental conditions, hazards, initiative required, stamina required, win/lose situations and public contact. The scores don't include an individual's working conditions, boss, co-workers, mental outlook or other unquantifiable stress factors.

Source: *Jobs Rated Almanac* (John Wiley & Sons), New York

AT&T Paradyne preps affordable conferencing card

By Bob Wallace

AT&T Paradyne this week will announce a server plug-in card that could bring affordable voice/data conferencing to the masses.

The vendor will announce a card, dubbed the 2290 Dial Server, that enables Microsoft Corp. and Novell, Inc. servers at central sites to bring simultaneous voice/data transmission (SVD) to remote sites over several possible wide-area network connections.

The first-of-its-kind product lets remote workers talk and share documents displayed on their PCs. They must have 9.6K bit/sec. or higher-speed dial-up lines or Integrated Services Digital Network access to use it.

The technology was developed to support voice/data conferencing over regular telephone lines. With SVD, users don't need often-expensive stand-alone servers or separate WAN lines for voice and data.

Mass appeal

"SVD is an emerging and promising technology that could make life easier for IS managers by making conferencing affordable to most users," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J. "Developing a plug-in card for those two top servers was a wise move."

One user expressed interest in the card. "This sounds like it would be excellent for telecommuters who are doing things like remote order and insurance processing," said Maralyn Rosenblatt, vice president of client services at Countrywise Home Loans in Pasadena, Calif. "And it could be a natural for help desk applications, too."

Rosenblatt said the high cost of conferencing has kept it from proliferating but added that products such as the new card, which ships in July for $5,995, could change that.

Each port on the card can support the three WAN options; many of today's remote-access products can support only one. That means users need to publish only one number for remote sites to dial in on.

To use SVD, users at remote sites need special modems. AT&T Paradyne makes them, and sources said Rockwell International Corp. is prepping an SVD chip set that would make SVD modem development easy for more vendors.

Paradyne, which declined to comment on the announcement, faces an uncertain future. AT&T put the company up for sale months ago, but no one has snatched up the unit. Insiders say several vendors are interested in Paradyne's technology but don't want to buy the entire company.

Oracle7 Parallel Server: Still Unparalleled.

Key Features	Oracle7	Sybase ~~System 10~~ SQL Server 11
[illegible]el Processing Strategy	✓	✓
[illegible]el Processing Slideshow	✓	✓
[illegible]olerant Parallel Server (Clusters)	✓	☐
[illegible]el Query Software	✓	☐
[illegible]el Index Software	✓	☐
[illegible]el Recovery Software	✓	☐
[illegible]ms Supported with [illegible]l Features	20+	None

Sybase may have changed the name of their database, but they didn't change its "parallel nothing" architecture. Oracle7's parallel everything database architecture makes open system computers faster and more reliable than mainframes. Call Oracle for the software, 1-800-633-1071, ext. 8110. Call Sybase for the slideshow, but please, call one at a time.

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Win 95, NT plans mapped

OS integration may simplify system management

By Bob Francis
SAN JOSE, CALIF.

Hoping to address user concerns, Microsoft Corp. last week unfolded its Windows NT and Windows 95 road map, and all signs pointed toward simpler management and tighter integration of the two operating systems.

"This is good for us because we can pick and choose which operating system we want to use without a penalty for using both," said J. Matthew Merrick, vice president of information systems at The Merrick Publishing Co. in Louisville, Ky.

As outlined at the Windows Hardware Engineering Conference here, Microsoft plans to do the following:

- Deliver Win32 API, a common set of application programming interfaces (API) for Windows 95 and Windows NT, later this year.
- Move in 1998 to a common kernel for the two operating systems, which will ease application development and should cut the user support burden.
- Make Windows NT 4.0 generally available this summer. The upgrade will include the Windows 95 interface.

Relief for managers

The availability of the Win32 API — and the move to common device drivers, which Microsoft announced earlier this year — should eventually relieve support headaches common to IS managers.

"That gets a big 'applaud' from me," said Joanne Witt, a help desk manager at a network management company in the Northeast. Finding the proper device drivers for the right version of an operating system has been a top IS support problem for years, Witt said.

Even Microsoft isn't immune to the effects of these drivers. Chairman Bill Gates said 40% of support calls to Microsoft are related to driver problems.

The Redmond, Wash.-based vendor also talked about Nashville, the code name for an Internet package that will be integrated with Windows 95 in the third quarter.

Nashville will include Internet Explorer 3.0, a mail client and news reader. The package will let users use the World Wide Web browser as their interface if they wish, noted Dwight Davis, an editor at "Windows Watcher," a newsletter based in Redmond.

The next two major NT releases, scheduled for next year, are code-named Cairo and Memphis. Cairo won't include an object-oriented file system to NT, as had been promised. But Merrick said he was unconcerned about that missing piece. "I was kind of wondering how we could manage that if it had it," he said.

Cairo will include security features, a directory based on Microsoft Exchange directory services and OLE management services. Those services will take management information from Simple Network Management Protocol, the Desktop Management Interface and other proprietary applications in to OLE objects on the Cairo server.

Key Windows release dates

- Windows NT 4.0 and Windows 95 Service Release 2.0
- Win32 driver
- Windows NT clusters – paired servers
- Internet add-on package
- Next major releases, Memphis and Cairo
- Windows NT clusters – 16-node, enhanced scalability

IBM waves wand at Merlin

OS/2 Warp upgrade to offer Web browser, remote access

By Laura DiDio
LAS VEGAS

IBM unveiled its next OS/2 Warp upgrade, which will include integrated Internet and remote access capabilities, at Networld/Interop '96 here last week.

The new version of OS/2 Warp — code-named Merlin — is due in the second half of this year. Merlin will include an internal World Wide Web browser and will give users a way to save frequently visited sites as desktop icons.

IBM also will merge the remote access capabilities in OS/2 Warp Connect with the core operating system platform, said Jeff Howard, OS/2 brand manager at IBM.

"Having two separate platforms — one for core desktop features and a second package for remote access — was confusing to our customers," Howard said. "So we're melding OS/2 Warp Connect into OS/2 Warp and giving users a single package for desktop, Internet and remote access capabilities."

Networld/Interop '96

Ray Pratts, senior technical analyst at Variable Annuity Life Insurance in Houston, said that suits him just fine. He said merging remote access facilities into the core operating system will save the insurance company lots of setup time. "It used to take us weeks to refine all our communications protocols every time we upgraded the operating systems. Now, OS/2 Warp automatically configures our protocol stacks so that I don't have to," Pratts said.

Mike Conlon, director of resources at the University of Florida's College of Liberal Arts in Gainesville, Fla., also applauded the prospect of integrated Internet access.

"We have 100 Web servers on campus. The Internet access capabilities in Merlin will make it a lot easier for people to do their work," Conlon said.

Instant access

With a built-in Web browser and object-oriented technology, users will be able to place on their desktops icons that represent the most frequently visited Web sites.

Users then would be able to click on those icons to instantly launch an Internet home page.

Bill Howey, senior systems consultant at Avco Financial Services Corp. in Irvine, Calif., said the uniform resource locators represented by the icons can be loaded on and off diskettes and into folders on the computer, "like an on-line file cabinet."

"If you know how to change a feature on one object, you can employ the same method for all the objects," Conlon said.

This is in stark contrast to Microsoft Corp.'s Windows 95 environment, which Conlon characterized as a "maddeningly inconsistent [operating system]. In Windows, what's a button in one tool is pull-down menu in another utility and a property in a third utility," he explained.

Merlin's integration promises to boost IBM's competition with Windows 95 and Microsoft's Windows NT Workstation.

Smoothing out Warp

The next version of OS/2 Warp, code-named Merlin, should ship in the second half of this year. Its features will include:

- An internal Web browser and object-oriented technology for easy Internet access
- A universal client that will connect to any network operating system, including NetWare and Windows NT Server
- Remote access capabilities and Mobile File Synchronization that lets users remotely access the corporate network

Ohio hardly taxes its NetWare setup. See page 63.

Microsoft adds 'net assistants

By Lisa Picarille

Continuing to fortify its Office suite of products with Internet-enabled features, Microsoft Corp. this week will offer Internet Assistants for its database and project management applications.

Internet Assistant for Microsoft Access for Windows 95 and Internet Assistant for Microsoft Schedule+ for Windows 95 can be downloaded for free at Microsoft's World Wide Web site at http//www.microsoft.com.

Both products let users convert data to Hypertext Markup Language (HTML), create HTML documents and create direct links to specific Web addresses.

These offerings round out Microsoft's initial plans to make Internet features available as add-ons for all Office components. In the past several months, the Redmond, Wash.-based software giant has released Internet Assistants for Word, Excel and PowerPoint. Microsoft eventually plans to more fully integrate these capabilities into Office 97, which is due by year's end.

Microsoft also is putting a new face on FrontPage, the Web authoring and management tool it acquired from Vermeer Technologies, Inc. The latest version of FrontPage, due to ship in June, sports an updated interface similar to Office applications. The product is now accessible from within Office. A beta version of FrontPage can be downloaded free from Microsoft's Web site.

Corrections

Clarification: The International Oracle Users Group-Americas will hold International Oracle User Week (IOUW) '96, an educational track, in conjunction with Oracle's Open World, Nov. 3-8 at the Moscone Center in San Francisco. The group also will also hold IOUW '97, a user conference, sometime next spring, at a location yet to be determined.

The brief, "Wall Data simplifies E-mail system" [CW, March 18], incorrectly identified the price of Wall Data, Inc.'s Rumba Mail electronic-mail software as $4,100 per user. The correct price is $100 per user.

In "Leaders of the Pack," in the March 25 issue, Diane Schwarz was incorrectly identified as manager of financial systems at Marine Optical, Inc. She is actually with Steelcase, Inc.

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IBM integrates Tivoli tools

Claims leadership in management software

By Patrick Dryden
LAS VEGAS

IBM last week stitched together some SystemView components and the newly acquired Tivoli systems management suite — and then proclaimed itself the leader in integrated tools for managing systems, networks and applications.

But IBM-watchers at Networld/Interop '96 here recoiled at the 1950s-era arrogance they perceived in IBM's effort to turn the Tivoli Management Environment (TME) into a de facto standard.

Users of TME and IBM's SystemView, NetView and other tools were either cautiously optimistic or worried that some overlapping products may lose support.

TME 10, the management suite from IBM and its new subsidiary Tivoli Systems, Inc., promises to manage core functions from laptops through mainframes. It will be available next month, but pricing hasn't been decided because IBM and Tivoli have very different pricing models, officials said.

John M. Thompson, senior vice president of IBM Software Group, said TME 10 will deliver the best of both worlds for handling large-scale environments — Tivoli's object-based client/server tools and IBM's SystemView for MVS.

"TME 10 is the first and only solution" to integrate management of all systems, applications and types of distributed computing, he said. And it does so in an open framework that even competitors can support, he claimed.

John M. Thompson *of IBM Software Group denies the company is trying to dictate industry standards*

But IBM officials ignored similarly integrated offerings from Cabletron Systems, Inc., Computer Associates International, Inc., Hewlett-Packard Co. and Europe's Groupe Bull, analysts noted.

IBM and Tivoli also outlined their plans to fill in the blanks and sort out overlapping products. Users can get the details at http://www.tivoli.com.

Questions remain

But the product road map hasn't answered all questions, said Atul Kapoor, principal at Kaptronix, Inc., a consultancy in Haworth, N.J.

He said issues remain, including how IBM will share management data with HP and other major vendors and how TME 10 will address user needs beyond the Unix and MVS environments, which vendors such as Microsoft Corp. and Novell, Inc. now meet.

"This is still an IBM/Tivoli view of the world," Kapoor said. "Their definition of 'open' — to follow their defined standard — is the same old proprietary story."

Thompson angrily rejected charges that IBM is trying to dictate industry standards. He told *Computerworld* that IBM recognizes it has a much smaller market share and wants to work with other vendors to define standard interfaces in TME 10.

Users would benefit from a common interface, but it isn't realistic to expect rivals such as CA, HP, Cabletron and IBM to agree on a standard, said Tim Wilson, an analyst at Decisys, Inc., a network consultancy in Sterling, Va.

Users said they need more details to determine how the repackaging will affect them.

Mitch Hull, director of software development and support at Florida Power Corp. in St. Petersburg, Fla., uses Tivoli and IBM products. "I expect a good fit from both pieces to the puzzle, but I'm concerned about how they will wind up supporting the components we use that overlap," he said.

Distributed storage management is getting more mainframe-like, but gaps remain. See page 49.

IBM alternatives already integrated, scaling

Competitors in the integrated systems and network management arena aren't sitting on the bench while IBM proclaims itself the only integrated platform player on the field.

Computer Associates will begin beta-testing Unicenter: The Next Generation (TNG) this month and deliver the replacement for the popular Unicenter systems management suite by year's end, officials told *Computerworld* last week.

Unicenter TNG offers a three-dimensional interface and tightly linked views into formerly separate management functions to simplify monitoring and speed familiarity with tools required to manage heterogeneous network environments.

In the next few months, CA will expand Unicenter TNG's view into Unix and Windows NT management to include MVS environments, said Marc Sokol, product strategy vice president.

Hewlett-Packard rolled out the distributed Tornado version of its Network Node Manager. The long-awaited OpenView network management platform now can scale to support 10 times as many devices and associated database objects. A new design slashes the network monitoring traffic to free up resources on management servers.

And Cabletron sent Spectrum 4.0, its distributed and integrated management platform, to about 20 key users last week. Full-scale shipping should begin this month, officials said.

— Patrick Dryden

News Shorts

IBM readies rollout of AIX Version 4.2

IBM in two weeks plans to introduce Version 4.2 of its AIX operating system with support for larger file sizes and added Internet features. AIX 4.2, which will be announced at an IBM developers conference in Nashville, will accommodate 64G-byte files and 1T-byte file systems, IBM officials said. It also will support Version 3 of the Network File System. The company this week will more than double the throughput of the switch in its RS/6000 SP parallel processor.

Dell gets new memory

Dell Computer Corp. in Austin, Texas, this week will become the first major PC vendor to ship a PC with synchronous dynamic RAM as a standard feature. Synchronous dynamic RAM is faster than either EDO dynamic RAM or Fast Page dynamic RAM. It will be standard on many desktop PCs delivered later this year, according to Desi Rhoden, a manager at VLSI Technology, Inc. in Tempe, Ariz. Dell's Dimension XPS 166 will cost $3,799.

Cheyenne offers database agent for Exchange

Cheyenne Software, Inc. last week expanded its support for Microsoft Corp.'s BackOffice suite of server products with a database agent. The ARCserve Database Agent provides users with backup-and-restore facilities for the Exchange messaging server. Used in conjunction with Windows NT Server, the agent lets network administrators perform backup-and-restore operations while Exchange is in use. Shipping now, ARCserve Database Agent for Microsoft Exchange Server has a list price of $995.

Faster, cheaper chip

Digital Equipment Corp.'s semiconductor division last week introduced a chip that it claims will lower the cost of 100M bit/sec. Fast Ethernet networking. The Peripheral Component Interconnect-based 21143 Ethernet controller chip can be integrated on a network interface card, a PC motherboard or, with CardBus adapters, on mobile computers. According to a Digital spokeswoman, the chip's highly integrated design will help lower costs of 10/100Base-T network cards from $40 to as low as $23.

Attachmate integrates Exchange with messaging

Attachmate Corp. has announced software that lets Microsoft's Exchange messaging software integrate with IBM Profs and System Network Architecture Distributed Services (SNADS). Attachmate's Extra Connectors run on Windows NT servers and let Exchange users send messages and schedule meetings in real time on the host systems. The Profs connector costs $12,500 for a server license and 250 client licenses; the SNADS connector costs $12,000 per server.

Digital stock trading eyed

Spring Street Brewing Co., which created a stir at the Securities and Exchange Commission last month when it began trading its stock over its World Wide Web site, has announced an ambitious plan to create a digital stock exchange through which secondary trading of securities can occur over the Web. Companies also could issue initial public offerings. The New York-based microbrewery intends to support the initiative through a new company called Wit Capital Corp., named after its Wit beer.

Lotus tries to stop ad

Open Text Corp. has filed suit against **Lotus Development Corp.** in response to a cease-and-desist letter from the Cambridge, Mass., groupware developer. Lotus objected when Open Text marketed its intranet software suite with advertisements that used a picture of a Notes CD-ROM with the word "adios" beneath it. In its suit, Open Text in Waterloo, Ontario, is asking to have Lotus barred from interfering with competitive advertising.

Informatica's data mart

Informatica Corp. in Menlo Park, Calif., today will announce PowerMart, software to design and manage single-subject data warehouses called data marts. Available by May 1, PowerMart will be priced starting at $45,000. Its server runs under Sun Microsystems, Inc.'s Solaris, IBM's AIX and Microsoft's Windows NT, and its client runs under Windows and Windows NT. Data can be extracted from both relational and nonrelational data sources.

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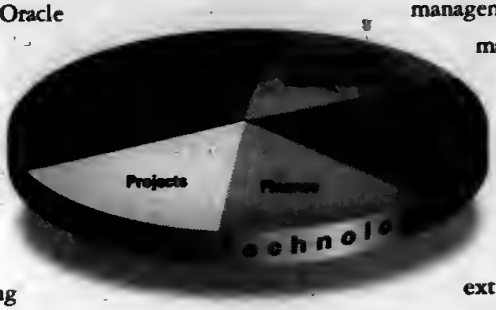

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Memo hints at Apple strategy

By Lisa Picarille

A widely circulated, unofficial memo from within Apple Computer, Inc. may offer a snapshot of the key issues Chairman Gilbert F. Amelio is likely to address when he reveals his fix-it plan May 15.

The memo was written by an employee who took part in an informal discussion group with Amelio, who contended that Apple's problems were fixable.

Among the issues the chairman touched upon was the notion that Apple can no longer compete on price, so it needs to charge a premium for its systems.

One user interviewed last week said that regardless of whatever grand strategy Amelio unveils next month, his company is invested too heavily in Apple technology to give up the Macintosh — at least for now.

Stephen Priest, director of Hospital Information Systems at Dartmouth-Hitchcock Medical Center in Lebanon, N.H., said, "We are continuing to expand both the Mac and PC networks, and we are struggling to keep our organizations consistent." The center has hundreds of Macintoshes and PCs.

"If a department is all Macs, then we want to buy more Macs. But we are also extremely cost-conscious," he added. "All things being equal, we are likely to go with the lowest-cost product."

Excerpt of an E-mail from employee to Apple Fellow Guy Kawasaki

He [Amelio] noted that we were heaviest hit in corporate sales due to the intense barrage of bad press....

...He [Amelio] said we simply cannot compete dollar for dollar with [top PC makers]. So we must be perceived as a more desirable, more reliable, higher value computer.

This doesn't bode well for a premium price plan because most users weren't happy about paying more for their Macintoshes. Macintoshes have always cost more than PCs, and their prices were just starting to come in line with that of PCs.

"I'm not thrilled about paying more for Macs, since Windows 95 took away a little of the advantage of the Mac OS," said an information systems manager at a large manufacturing company in the Northeast, who asked not to be identified.

Other issues raised in the memo included the following:

- The importance of operating system software quality and stability and the need for memory protection to ensure that.
- The need for a standard interface between the Mac OS and the motherboard to make it easier for Apple to update and maintain the operating system. Currently, the Mac OS is estimated to have more than 100,000 unique configurations to support a wide variety of exotic application specific integrated circuits and chip form factors.
- Beefed-up communications between management and Apple employees as well as with customers and the press.
- A desire to keep the Newton development in-house and give it more support.

An Apple spokeswoman said Amelio's comments should be taken as informal and not misinterpreted as an Apple policy statement.

According to one analyst, Apple is likely on May 15 to announce plans to streamline its unwieldy product line, rather than exit any particular segment of the market.

One bright spot on Apple's horizon may be Copland, the next generation of Apple's Macintosh operating system. Originally slated to ship this summer but now due out by year's end, Copland is expected to help boost Macintosh sales.

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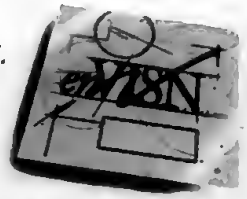

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Lotus slowly spins Notes into Web

Server support for HTML, HTTP coming

By Tim Ouellette

Lotus Development Corp. is firming up its Internet offerings to make its Notes groupware work better with the global network.

Signs that the Cambridge, Mass., subsidiary of IBM will deliver on its World Wide Web promises are appearing all over.

For example, Lotus last week confirmed it will ship native Notes server support for the Hypertext Markup Language (HTML) and Hypertext Transport Protocol (HTTP) Internet standards earlier than planned.

It separately announced it is beta-testing a Notes-native Internet electronic-mail connection. And it has shipped InterNotes Publisher 4.0, software that lets users publish Web content and manage Web pages (see chart).

Lotus officials said they would consider native HTML and HTTP support in Notes clients, which will let the clients bypass Notes servers to access the Internet.

Native Notes server support for the HTML and HTTP protocols will let Notes servers act as Web servers. Companies building intranets and using Notes could combine both under a Notes server accessible by Web browsers and Notes clients. InterNotes Publisher 4.0, included in Notes 4.0, lets users create and manage Notes documents that can be translated into HTML format and accessed by Web browsers.

"Native HTTP and HTML support is a big plus to help leverage Web integration and make it that much easier to manage. That is the key piece they have been missing," said Tim M. Crawford, a technical project manager at National Semiconductor Corp. The Santa Clara, Calif., company mixes Web technology for simple access with Notes technology for information management and development.

Notes serves the Web

Integrating Notes with the Web will require the following:

- InterNotes Web Publisher 4.0 and Web Navigator browser
- Native Internet Protocol support on Notes server to access the server from Web browsers
- NotesView 4.0 management software to track and manage Web access from InterNotes Web Navigator
- Native Internet E-mail message transfer agent lets Notes 4.0 servers exist natively in an SMTP/Multipurpose Internet Mail Extension-based Internet mail environment
- Native HTTP/HTML support in the Notes clients

Separately, a Lotus spokesman downplayed as conjecture published reports that quoted a Lotus executive saying the company is looking into licensing Notes' security and replication features. He insisted Lotus isn't publicly discussing such steps right now.

Sparks interest

The moves help solidify user confidence in Notes, which could reduce the attraction of cheaper — if somewhat less functional — Web technology as a groupware alternative.

"Yes, we are interested" in the Internet updates, said David Beckman, a partner at Beckman, Hirsch & Eli, a Burlington, Iowa, law firm. "If Notes had not embraced the Internet, Notes would be in steep decline right now."

With large user sites looking at Notes for developing Web content, "it is extremely important that Lotus delivers on its Web promises," said Nina Lytton, president of Open Systems Advisors in Boston.

Around the corner

Notes 4.0 shipped in January without native HTML and HTTP support, so users had to buy a separate Web server to get the same functionality. Chief Operating Officer Jeffrey Papows said Lotus will ship the native support in Notes 4.11, not Notes 4.2 as previously expected.

Papows said Notes 4.11 would be available this month, although Lotus officials changed the date to "sometime this quarter." Notes 4.2, expected around midyear, will add native calendaring and scheduling features.

The Simple Mail Transfer Protocol (SMTP), X.400 and CC:Mail native message transfer agents that are in beta testing will help Notes' messaging keep pace with Microsoft Corp.'s Exchange, which is now shipping with SMTP and X.400 gateways. Lotus expects to deliver the agents by midyear, when it will announce pricing.

Laptops push PCs off desktop

CONTINUED FROM PAGE 1

Driving the switch to portables as primary computing devices is the migration to the virtual office concept of work, according to analysts. That's when users can compute from just about anywhere with access to corporate databases and networks. Information systems managers eventually will start to choose between notebooks and desktops, rather than providing both — and notebooks will win, according to industry analysts.

"Eighty percent of my purchases in the past year have been notebooks," said Doug Moran, an IS manager at CRSS Constructors, Inc. in Denver. "I see the mix between desktop and portable users becoming more like 60-40, in favor of notebooks, in the next couple of years. And that is probably quite conservative."

Not for everyone

	High-[illegible]otes	[illegible]
Fastest processor	133-MHz Pentium	200-MHz Pentium
Screen size	Up to 12.1 inches	14 inches or larger
Memory	Up to 8M bytes	Up to 16M bytes
Price	$4,000 to $6,000	$3,000 (average)

Tipping the scale

Users say this is already starting to happen. Support and administrative staff will always need desktops, they note, but among corporate professionals, the scale is beginning to tip toward notebooks.

Users say this trend is becoming easier to swallow financially because the price gap between desktops and notebooks — traditionally notebooks have cost almost double what a standard PC costs — is narrowing. According to Meta Group, Inc. in Stamford, Conn., the price difference will shrink from about $1,800 to $800 this year for comparable systems (see chart) and then to about $600 next year.

There are less obvious financial gains. "If [laptop users] work an extra two to three hours a week, you are definitely getting your money's worth," Ablondi said. "They are more productive and less stressed out if they can pick up their computer and run and work when they can."

Also aiding notebooks is the fact that notebooks have kept up with desktop power trends. Laptops now deliver chip speeds of up to 133 MHz, and desktops offer speeds of up to 200 MHz. This is a much smaller performance gap compared with just a few months ago.

Lack of support

But supporting mobile workers is becoming an increasingly thorny issue, users say. A recent study from Infonetics Research, Inc. in San Jose, Calif., said large U.S. businesses spent an average of about $4.8 million on remote access in last year. Of that amount, only 15% went to acquisitions, while a surprising 35% was eaten up by workers trying to configure or repair their own laptops and other equipment.

"Notebooks are a much bigger asset-tracking and management nightmare for me," said George Staton, an assistant vice president at Commerce Bank in Cherry Hill, N.J. "But we just don't have a choice — if their work justifies it, the users want laptops."

Notebooks are getting faster. See page 49

IBM tests 'network' PC to spiral costs downward

By Bob Francis

Everything old is new again — or so IBM thinks.

In a move to drive down the overall costs of PCs for companies, the IBM PC Co. is test-marketing a "network-centric" PC.

Ozzie Osborne, vice president of system strategy at the IBM PC Co., said the company is shipping several hundred of the devices to customers. But IBM is still evaluating whether to offer the systems in its PC lineup.

"We're doing this as a way to reduce the cost of administration of PCs," he said. Those costs are estimated to be about $41,536 for a basic desktop PC over a five-year period, according to a study by Gartner Group, Inc. in Stamford, Conn.

The systems will be priced similarly to regular desktop PCs, but the overall costs will be lower because the software, communications and hardware will be controlled from the network, Osborne said.

The PCs were designed with the monitor integrated into the system, a keyboard, a mouse, network connections — and no hard drive.

The "network-centric" PC includes IBM's PC SystemView, formerly NetFinity, which allows systems administrators to monitor and manage the system remotely.

The systems also include IBM's Wake-on-LAN technology, which allows network managers to power on unattended systems from other stations on the LAN.

A number of companies had offered "diskless" PCs several years ago, but most have dropped them, said Martin Reynolds, an analyst at Dataquest, Inc. in San Jose, Calif. "They didn't really seem practical at the time," he said.

Mixed feelings

While the concept may attract some information systems managers, others believe it limits user flexibility.

"I think you're just reducing some of the capabilities your end users have when you do this. It might work in some cases, but it seems a step back to me," said Joanne Witt, a help desk manager at a network management company on the East Coast.

"You've got reliable bandwidth now, and more users are running applications across the network, so we think there may be a market for this type of PC," Osborne said.

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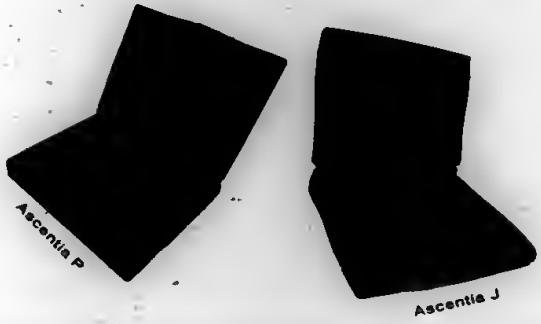

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Users clamor for 'net wares

Lack of security tools hinders commerce

By Bob Wallace, Patrick Dryden and Laura DiDio
LAS VEGAS

Their Web pages may be launched, but many of the users at Networld/Interop '96 here last week lamented the lack of Internet tools.

Chief among their complaints: the lack of robust security products, the dearth of administration and control-wares for World Wide Web pages, and the paucity of opportunities for one-stop shopping.

"We'd love to let our customers place orders for products through our Web page and provide [classified] information such as [specification] sheets and designed spec to our business partners. But we need more and better security first," said Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Plano, Texas. That may not happen until well into 1997, he added.

Like so many other U.S. companies, TI has a Web page that provides public information about the company. It also supports security to keep unauthorized users from accessing confidential data. But Sanders said he still worries.

UPS' Mark Dodge: *Greatest concerns are IS administration and access control*

Other seasoned Internet users echoed Sanders' concerns.

Elliot Shev, a vice president at Spectragraphics Corp., a collaborative engineering services company in San Diego, attended the show specifically to research security products. Spectragraphics has used the Internet to do business for the past 14 years, but the explosive growth of the Web has made Shev more leery about potential security failures.

The company gives "only certain highly privileged people" access to its internal network. "We constantly wrestle with security concerns, [questions about] who to let in to our network via the Internet and how we would track down a hacker," he said. "So far, our computer networks haven't been breached; I'm here looking for products to see that it never happens."

Internet security

Little leery

Per Agren, network infrastructure manager at Volvo Data Corp. in Sweden, said Volvo considers the 'net "secure enough for some applications, like making product information available on our Web servers, but we're not ready to distribute confidential business data that way."

Also, the Internet can't guarantee the on-time delivery that Volvo's private network does. "We couldn't depend on it for sending orders among plants," Agren said.

Yet another user sought products that will aid his company's intranet efforts.

"We've extended our Internet activity to build an intranet, which has grown dramatically this year," said Marc Dodge, telecommunications manager at United Parcel Service, Inc.'s office in Mahwah, N.J. "We need help to meet the publishing, security and bandwidth needs of our intranet users."

But Dodge said his greatest concern centers on information systems administration and access control of resources.

"Big corporations see content quickly spreading from the top to the low levels and far corners," he said. "Users find an incredible number of ways to use an intranet for communication."

Seagate battles for respect in workgroup tools market

By Patrick Dryden
LAS VEGAS

Seagate Technology, Inc. last week announced new products and yet another acquisition of a software vendor in a bid to be taken seriously as a provider of workgroup management tools.

Seagate's Boston-based Enterprise Management Software unit — known as Frye Computer Systems, Inc. until its acquisition a year ago — is rolling out a Windows-based suite of tools for LAN managers.

Master plan

The Seagate Desktop Management Suite helps LAN administrators with chores such as software distribution, upgrades, remote control and asset management.

Seagate acquired OnDemand Software, Inc., which will add the well-regarded WinInstall to the Seagate suite. WinInstall helps distribute, install and uninstall both 16- and 32-bit applications on Windows clients.

The announcements were made at Networld/Interop '96 here.

"Frye lost visibility this past year, but now they are emerging with a full set of tools that go beyond the control and automation of day-to-day administration to help users migrate from Windows to Windows 95 or NT," said Rick Villars, director of network architectures research at International Data Corp. (IDC) in Framingham, Mass.

Seagate's Desktop Management Suite

Collects, tracks and reports network hardware/software inventory and changes	Distributes, installs and deinstalls 16- and 32-bit Windows applications	Centrally monitors and controls PCs and servers

By emphasizing the Windows migration tools, Seagate can get a jump on the five competitors leading this market, Villars said.

IDC ranks Intel Corp., Symantec Corp., McAfee Associates, Inc., Novell, Inc. and Microsoft Corp. ahead of Frye/Seagate in this market niche. Other challengers include Digital Equipment Corp. and IBM.

Workgroup management

OnDemand, acquired for $13 million in cash, gained respect last year for providing a much-needed software distribution interface for Microsoft's Systems Management Server, according to Villars.

Seagate's road map calls for further enhancements to the suite this year, either homegrown or through more acquisitions. These include virus prevention and help desk components, which some competitors already offer.

One Canadian user of WinInstall said he has found problems with Symantec's Norton Administrator and Intel's LANDesk. Ron Patterson, a systems analyst at Shell Canada Ltd., said he likes the idea of integrating WinInstall's "life-saving" features with the Seagate suite. However, he said he remains concerned that "acquisition-happy Seagate must pull together other products, which are disjointed now."

The Seagate suite will ship this month on one CD-ROM, starting at $1,495 for 50 stations. The vendor said all core tools launch from a tool bar and work together now.

To round out workgroup control, Seagate also launched the Seagate Server Management suite. It combines in one kit Frye's network management, early-warning system and console tools for maintaining Novell's NetWare networks. The kit is priced at $770 per managed server.

Sterling gives legacy apps Internet access

By Michael Goldberg

Sterling Software, Inc. last week announced two software packages that provide end users with access to legacy applications via standard World Wide Web browsers on the Internet.

Users and analysts said the new products could offer some relief for mainframe shops working to provide Internet or intranet access to applications that are too mature to be easily replaced.

The first package, called Star:View, was designed to connect PCs and workstations to MVS-based applications on a mainframe generating 3270 data streams.

Slated for sale in September at $1,995 per 10 end users, Star:View software sits on a Windows NT application server between the mainframe and end-user clients that run Web browsers such as Netscape Communications Corp.'s Navigator or Microsoft Corp.'s Internet Explorer.

GUI builders

Both Star:View and a more advanced product, called Star:Gate, build on functions contained in "screen scraper" technology. Those functions render graphical user interfaces (GUI) from the text-only screens produced in mainframe-based applications.

Star:Gate was designed for custom application developers using standard Hypertext Markup Language protocols and Sun Microsystems, Inc.'s Java language. It is scheduled for release by September 1997.

Mike Campigotto, an IS project manager at the Ministry of the Solicitor General and Correctional Services in North Bay, Ontario, said he looks forward to trying out the Star:Gate application development environment next year. He said he will provide 'net access to workers using PCs at home.

"We have users screaming for point-and-click and pull-down functions, and we can't afford to scrap [the applications] we have and rewrite them," Campigotto explained. His agency is rolling out screen scraper technology to about 100 users.

System integrator Don Berman at Client Server Strategies, Inc. in Wyckoff, N.J., said he would like to test the functions in Sterling's products that promise automatic creation of GUIs. The software, he added, "is supposed to have the ability to learn how people use the system, as opposed to just mundanely rendering [applications] one screen at a time."

Melinda Ballou, a Boston-based analyst at Meta Group, Inc., said Sterling is one of many firms looking to provide what amounts to client/server migration software for mainframe and other legacy applications. Another example is a product called GUISys from Client/Server Technology, Inc. in Atlanta, which was designed to bring legacy applications to client/server setups, she said.

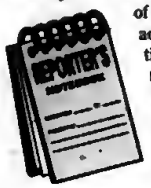
Users, vendors let it ride at Networld/Interop

By Laura DiDio, Patrick Dryden and Bob Wallace

Activity at Comdex Jr., also known as Networld/Interop '96, was wildly frenetic this week.

Fire marshals had to disperse the crowds crammed in one booth in the Start-Up City exhibition area, while paramedics were called to Planet Hollywood to tend to a passed-out party-goer.

Nobody passed out at Microsoft Corp. Chairman Bill Gates' two-hour keynote address, but one person who actually made it to the speech (the waiting line snaked out of the Las Vegas Hilton adjacent to the convention center and across the parking lot) remarked, "The next time they give Gates unlimited time to plug his products, they ought to at least post a sign outside the door that says 'Brainwashing alert: This is a Microsoft infomercial.'"



The hottest booth — the one that drew the fire marshals — belonged to Ipsilon Networks, Inc. in Palo Alto, Calif. Ipsilon displayed Internet protocol switches, a new product category that combines the simplicity of a TCP/IP router with the speed and capacity of an Asynchronous Transfer Mode and frame-relay switch.

The picture was a little different at Banyan Systems, Inc.'s booth.

Company insiders at the show, who spoke on conditioo of anonymity, said times are still tough at the Westboro, Mass.-based firm. Banyan handed out 80 pink slips at Christmastime.

"Morale is still pretty low," one Banyanite said. "A lot of us are using Interop as a true networking show — to find other jobs." Banyan officials didn't return calls by press time.

Bay Networks, Inc. wins the prize for the most press releases handed out in a single day at a trade show: nine. But Bay's stock closed at 27⅞ last Thursday — way off the yearly high of 50.

Show attendees also buzzed about the merger of SBC Communications, Inc. and Pacific Telesis Group.

Ongoing talks between Nynex Corp. and Bell Atlantic Corp. prompted one user to ask, "How many regional Bell holding companies will be left by the end of the week?"

Anyone can play

Networld/Interop is about deals, after all, and in the best tradition of a Vegas hustle, one attendee was overheard explaining a scheme to underwrite the cost of running a T1 line to his house by becoming an Internet service provider.

The Internet was a major theme of the show. Ironically, attendance seemed lower this year, perhaps because some potential attendees opted to stay home and monitor events via the 'net.

Show sponsor Softbank Exposition and Conference Co. in Foster City, Calif., broadcast five keynote presentations over the Internet. Audio files and partial video clips of highlights will be available for downloading oext week on the World Wide Web at http//www.interop.com.

Unlike past years, few reporters at the show had to scramble for press kits, and exhibitors, rather than pass ont brochures, frequently advised visitors to check a home page.

Not that this mattered to the intoxicated attendee at the bash that IBM/Tivoli Systems, Inc. held to announce TME 10.

The new product blends pieces of IBM's SystemView with the Tivoli Management Environment (TME).

The sight of the smashed show-goer, splayed out on the floor, prompted other party-goers to gush that they liked this new IBM.

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Victoria's Secret

CONTINUED FROM PAGE 1

Victoria's Secret. The company is known for its lacy lingerie and associated catalogs that are chock-full of supermodels in sensual poses.

The lingerie chain last May started working with Tandem Computers, Inc. on a trial set of queries to see if a data warehouse could boost the $1.3 billion chain's fortunes.

Managers considered 25 items — mostly brassieres — from the chain's 1,000-item inventory, Amari said. They learned that Victoria's Secret's system of allocating merchandise to its 678 shops, based on a mathematical "store average," was wrong, he said. Last summer, they found out the following:

- An average store sells an equal number of black and ivory bras, but Miami-area consumers buy the ivory designs more often by a margin of 10-to-1.
- The demand at New York shops for bras with a bust size of 32 in. outstrips the company average inventory model by 20-to-1.
- Although Victoria's Secret applied merchandise discounts across the board at its stores, geographic demand patterns showed that some outlets should be able to continue charging full price. Amari said a more precise application of discounts could boost sales by an estimated $3 million.

These revelations about sales and inventory yielded a new way of thinking at Victoria's Secret shops, Amari said. "Our processes and systems were built around an average-shop concept, when in reality, our chain has few average shops. We found we were missing opportunities. And from that, we recognized we needed deeper [levels] of information at a lower level of detail and with rapid access to it," he said.

Retail industry consultant Mohsen Moazami said the lingerie chain joins a growing army of merchants who are trying to understand their customers' behavior with precision.

Data mining *revealed that many Victoria's Secret stores sell quantities of merchandise outside company averages*

A data warehouse application is a competitive advantage now, but it may not be in a year, said Moazami, national director of the advanced technology group at Kurt Salmon Associates, Inc. in Los Angeles. Food, clothing and other retailers that fail to invest in such technology "are going to be out of the game," he said.

Sandy Taylor, an analyst at Standish Group International, Inc. in Dennis, Mass., said the experience of the Victoria's Secret chain highlights a common theme among companies that are having success with data warehouses.

"Data warehousing is one of the few technologies where you can get back some very visible payback," Taylor said. "We have seen situations where the company discovers an early trend in product inventory where they basically recoup the price of the system with just one decision."

The value of the information in its test last summer — along with technical support from Tandem — prompted Victoria's Secret to pick a 10-processor Himalaya server as the hardware platform for its data warehouse, Amari said. The $5 million project will be in full production by August.

Tuxedo dresses up for the 'net cotillion

Tuxedo is being dressed up for electronic commerce. BEA Systems, Inc., which took over development of the transaction processing software from Novell, Inc. in February, plans to ship a native Java interface and an Internet gateway with the product in the fourth quarter.

The support for Java, Sun Microsystems, Inc.'s development language, will let Tuxedo customers process business-to-business transactions over the 'net. Two-phase commit capabilities will be included to guarantee that transactions are completed at each end or aborted if something goes wrong, BEA executives said.

Public-key encryption technology will be used. — *Craig Stedman*

Digging for data

IBM brings its might to data mining tools

By Dan Richman and Thomas Hoffman

IBM last week entered the data mining market with products that aren't unique but will likely appeal to information systems managers who want the comfort of large-capacity products from a large vendor, analysts said.

Intelligent Miner is a tool kit that developers and data analysts can use to discover trends within data. It can create applications that find patterns and aberrations within databases. This might help a financial services company detect the fraudulent use of credit cards or allow a retailer to stock up on items that are likely to increase in popularity, for example.

Intelligent Miner is set to ship for AIX by Aug. 1, for MVS by Nov. 1 and for OS/400 by Dec. 31, said Evangelos Simoudis, IBM's vice president of data mining solutions. Versions for Microsoft Corp.'s Windows NT and other vendors' Unix implementations will be released next year. Intelligent Miner will cost about $40,000, a spokeswoman said.

The other tool, Intelligent Decision Server, lets developers create applications for querying and statistically analyzing data. Like other query tools, it was designed to verify suspected or known trends rather than discover new ones.

Intelligent Decision Server will ship this fall and runs under OS/2 and AIX, Simoudis said. Pricing hasn't been set.

DB2 best fit

Both products will function optimally when accessing data in IBM's DB2 relational database management systems, he said. But they also will access other vendors' relational data through gateways, he said. Both were designed for warehouses of up to 100G bytes and will run optimally on multiprocessor machines.

"This is heavy-duty stuff being brought down for use on smaller parallel machines," said Aaron Zornes, a senior analyst at Meta Group, Inc. in Westport, Conn. "The low-end products don't address very large data warehouses."

But despite its enormity, IBM still needs to establish itself in a market where other players have already achieved name recognition. "When I think of data warehousing, IBM isn't the first name that comes to mind," said Steve Hasenfratz, supervisor of data management at Union Electric Co. in St. Louis.

IBM's data mining products grew out of services it had provided to customers such as Kroger Co. and MCI Communications Corp. during the past two years, said Ben C. Barnes, general manager of IBM's Worldwide Decision Support Solutions unit in Somers, N.Y. Those services, which include data scrubbing and building a data warehousing infrastructure, are available to all customers.

In the long run, IBM and other warehousing vendors draw most of their revenue from services instead of tools. That's because data warehousing "is so hard to do effectively and requires so many disciplines," said Brian Murphy, an analyst at The Yankee Group.

Assistant coaches Tom Sterner (Orlando Magic) (left) and Bob Salmi (New York Knicks) use an IBM system to analyze statistics and recognize patterns against different teams

The NBA's sixth man

The New York Knicks scored in 54% of their possessions in a recent game against the Charlotte Hornets. How? They put the better shooters on the floor's perimeter and forward Anthony Mason inside against the smaller Hornets.

Without that lineup, the Knicks scored in only 43.5% of their possessions against the North Carolina team.

Knicks assistant coach Bob Salmi obtained these insights by launching queries against an IBM data mining package called Advanced Scout. As part of IBM's sponsorship of the National Basketball Association, the Knicks and 15 other teams are testing the prototype software for free.

Salmi and other NBA coaches sift through mounds of statistical results by downloading the data from an NBA electronic bulletin board.

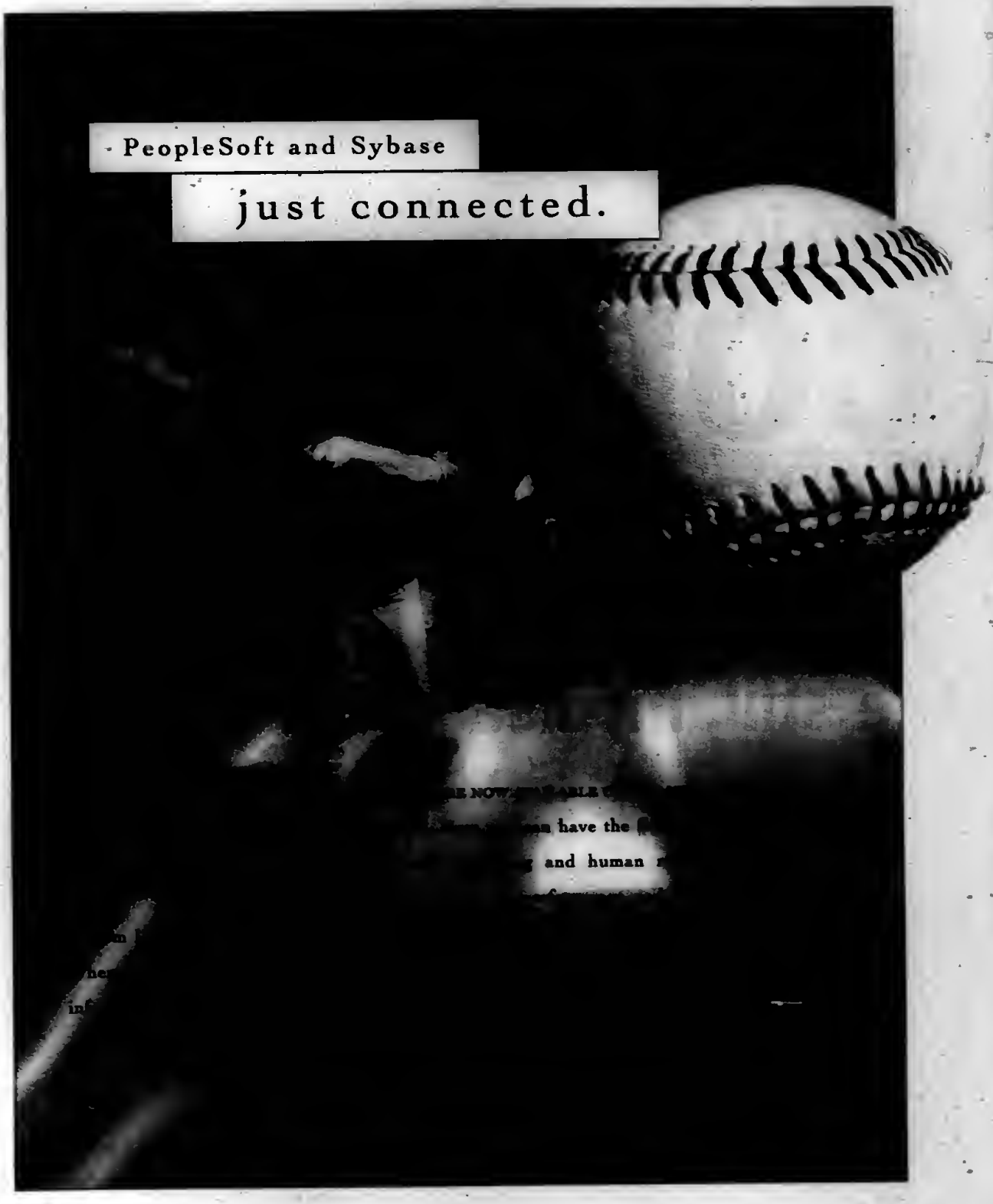
Ease of use has been an important feature, especially for self-confessed nontechies such as Salmi. "You've got [coaches] who are used to writing [plays as] Xs and Os on cocktail napkins in bars," said Salmi, who uses an IBM ThinkPad 760CD laptop to run the Windows-based application. Advanced Scout "isn't hard to use," he declared.

The software also helps coaches such as the Orlando Magic's Tom Sterner spend less time analyzing hours of videotapes in the wee hours after games. They can get most of the analysis they need from the Advanced Scout statistics.

"If we're stuck playing [the Knicks] in a seven-game playoff series, and I can get another two hours' sleep by using this system, I'm going to be an awful lot sharper during the game," Sterner said. "With millions of dollars and an NBA championship at stake, that's important."

Not to be outdone, the front-running Chicago Bulls are using their own closely guarded proprietary system for the same purposes, according to sources. — *Thomas Hoffman*

Parallelism is in. See page 51.



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Imaging show focuses on big picture

By Stewart Deck and Tim Ouellette

Talk about a new image.

Better yet, talk about document management, industry standards and proliferating partnerships.

Those big-picture trends were the buzz this year at the Association for Information and Image Management (AIIM) conference in Chicago.

"You didn't see imaging as the centerpiece of any booth this year," said Nathaniel Palmer, an analyst at Delphi Consulting Group in Boston. "This year exhibitors were showcasing components and component-based systems."

One component was delivered by Lotus Development Corp., which is shipping the Lotus Notes Connector for IBM's ImagePlus imaging software. With Connector, Notes users can take advantage of the high-end image storage capabilities of ImagePlus but don't need another interface to access image files.

"We didn't want to provide another interface for our users [besides Notes], but we wanted them to access image files," said Peter Reinhardt, a systems staff member at BASF in Germany. Connector will be deployed in BASF's human resources department and will let employees look through 120,000 on-line personnel folders that each hold between 10 and 200 image files.

Also prominent at this year's AIIM show was the perpetual push for industry standards. Last year, the Document Management Alliance standard was introduced; it allows interoperability among management applications. This year, vendors demonstrated alliance applications. Interleaf, Inc., for example, demonstrated Liaison, an interface for integrating document management with distribution and publishing products.

PC Docs, Inc. and Documentum, Inc. highlighted Open Document Management API (ODMA), a high-level interface that lets users transparently access a document management system from their desktop applications (see chart).

The Messaging Application Programming Interface (MAPI) standard turned up when Microsoft Corp. and Wang Laboratories, Inc. announced they had finished the MAPI Workflow Framework. The specification will let high-volume production workflow systems communicate with message-based workflow systems.

Partnerships were big news again this year. Wang and PC Docs announced they will work together on document management technology. Data General Corp. and OTG Software, Inc. will team up on imaging and storage for Windows NT.

And FileNet Corp. and Novell, Inc. announced FileNet Ensemble and GroupWise Workflow. For large production users of workflow software, Ensemble will provide low-cost workflow connections at remote and branch offices without the need for expensive software at every office. The product was well-received by analysts because it introduces users to workflow from within their electronic-mail environments.

AIIM-iable partnerships

Document mangement partnerships announced at the AIIM conference

Vendors	Partnership
Microsoft and Wang	Finished the MAPI Workflow Framework
PC Docs and Documentum	Created a query extension to ODMA
FileNet and Novell	Announced FileNet Ensemble and GroupWise Workflow
Adobe and FileNet	Proposed common extensions to TIFF and PDF

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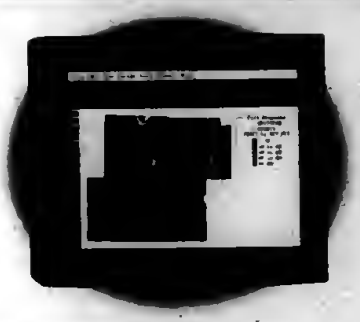

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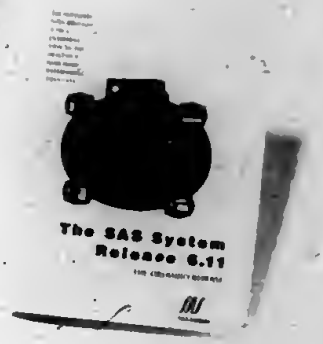

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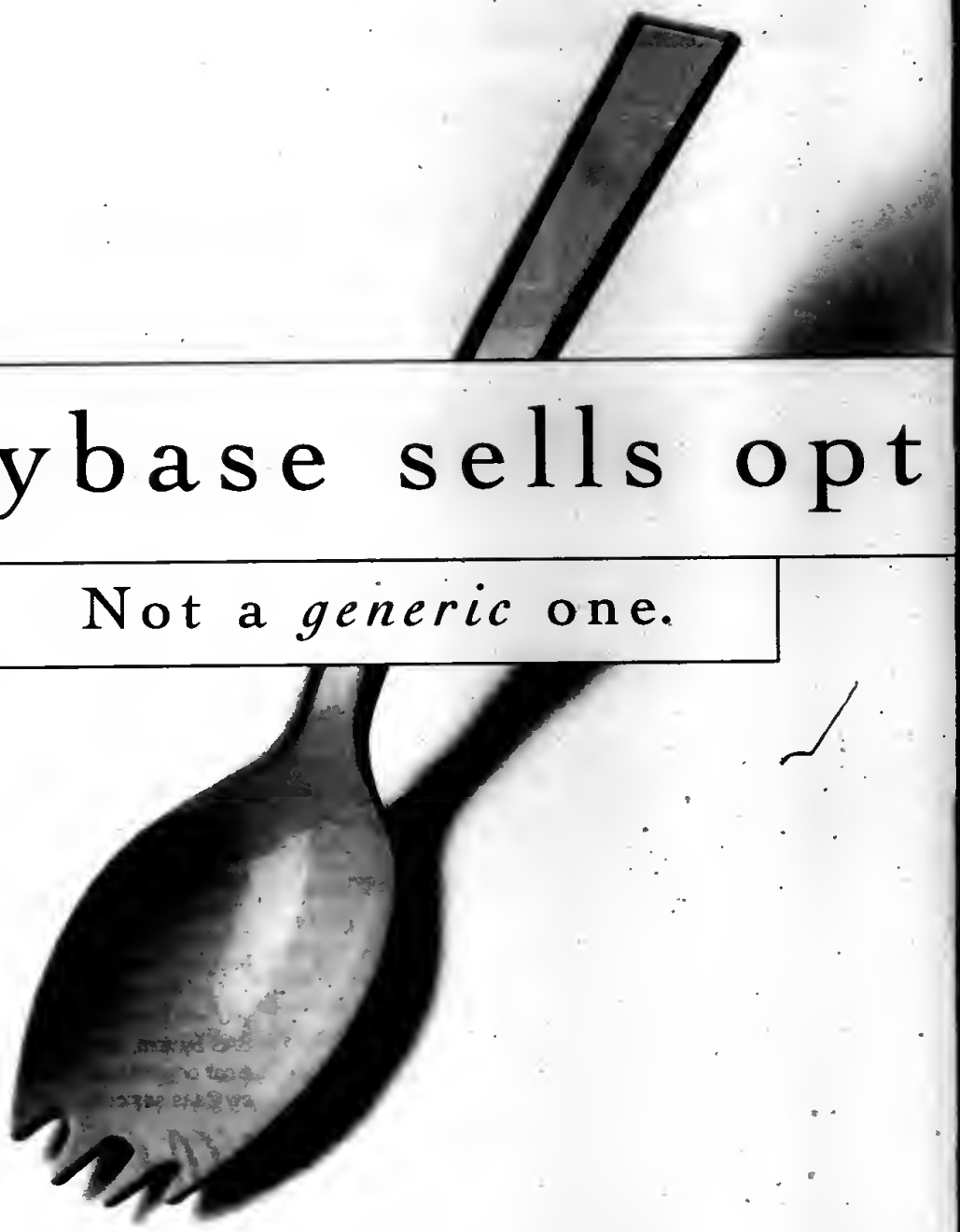

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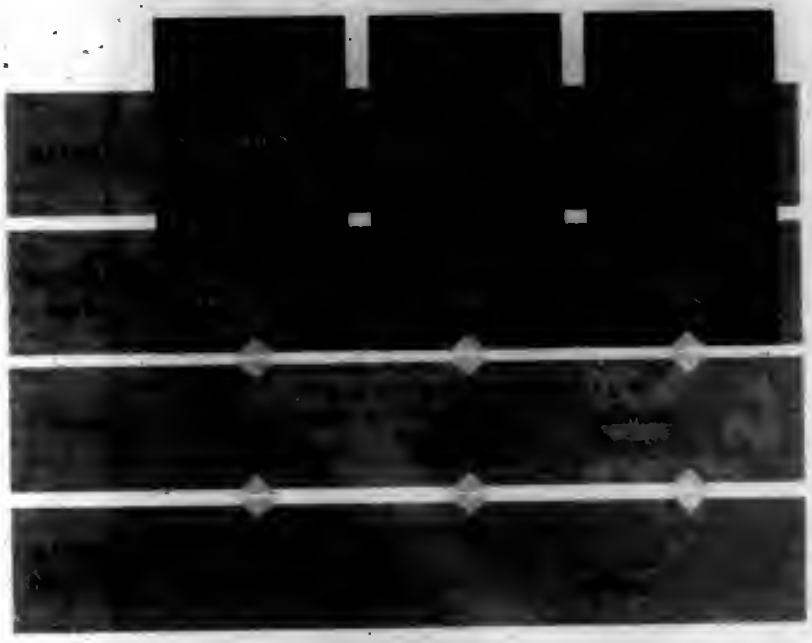

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Teeny, tiny notebooks head to U.S. market

By Rob Guth
TOKYO

Two Japanese companies, Toshiba Corp. and NEC Corp., will roll out miniature notebook computers, with NEC offering a $654 stripped-down version designed to send and receive electronic mail.

The market for sublaptop-size machines has been viewed as distinctly Japanese, but that may be about to change.

Toshiba lags behind rival IBM Japan Ltd., which has been selling miniature notebooks that resemble its popular ThinkPad notebook in Japan. But Toshiba will one-up IBM by marketing the mininotebook worldwide.

Conventional wisdom dictates that the market for diminutive notebooks outside Japan remains small, so IBM's mininotebooks remain Japan-specific.

"The nature of the North American market is that there just isn't enough demand for sub-subnotebooks," an IBM official said.

But for Toshiba, the recent success in the U.S. of personal digital assistants and similar products from Japan-based Sharp Corp. and Hewlett-Packard Co. points to a market for a miniature machine that supports Microsoft Corp.'s Windows 95, said Atsutoshi Nishida, general manager of Toshiba's PC Division.

"We want to rewrite the scenario for such a market," Nishida said.

Toshiba is the leader in portable notebooks and will unveil later this month a Pentium-based, miniature notebook PC that by year's eod will be available worldwide, Nishida said.

Pricing for the Toshiba unit will start at less than $1,870, according to a Japanese-language press report.

"It was very difficult for us to make the product small and light without any technology or functional compromise," Nishida said in an interview. But, he said, "this is no test product."

In Japan, one company already has ordered 44,000 of the diminutive notebooks, Nishida said. "I think many companies will show their interest after we launch the product."

NEC notebook

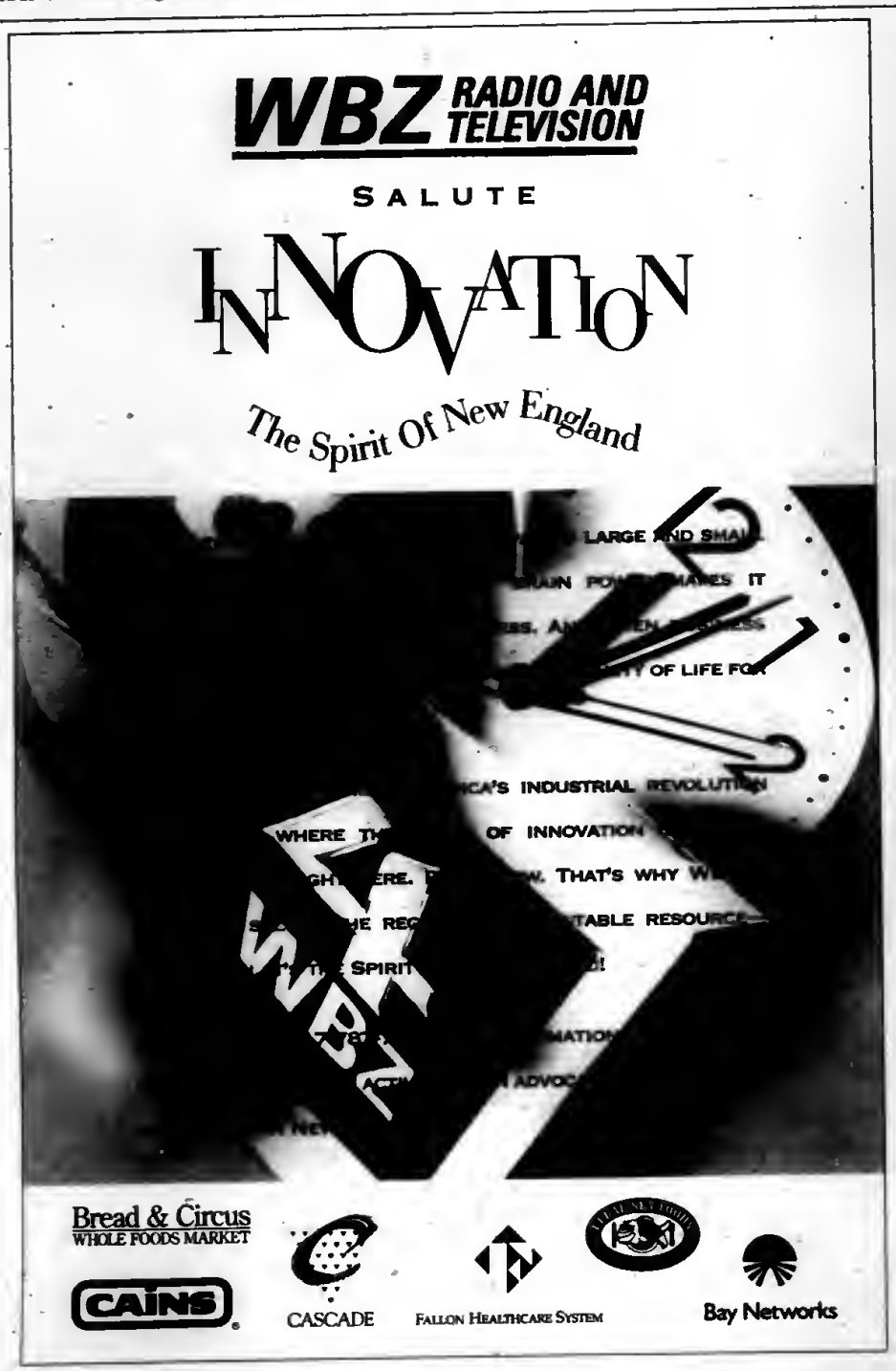
In June, NEC will bring to market a miniature notebook designed to send and receive E-mail, a company spokesman confirmed. The company hasn't decided whether to sell it outside Japan, the spokesman said.

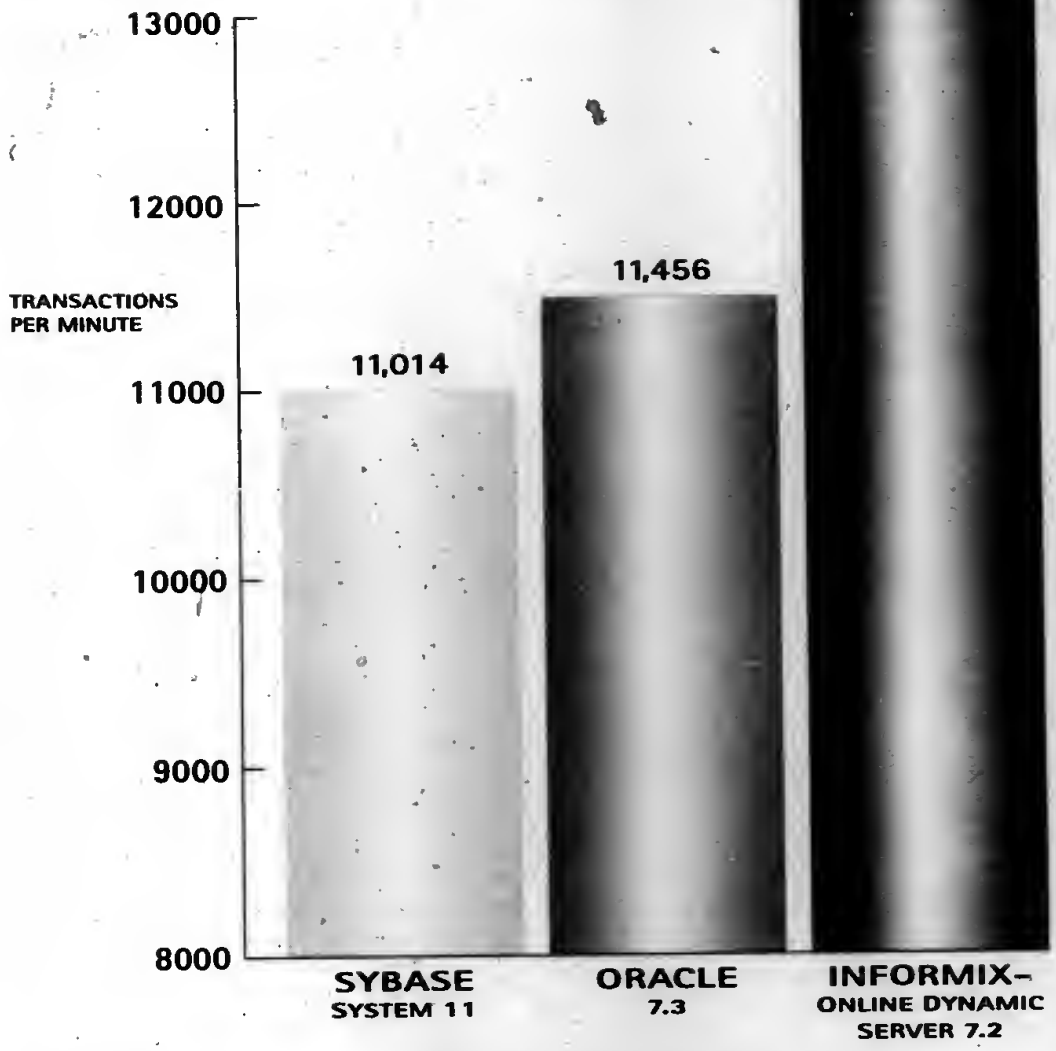
The NEC machine will be based on DOS instead of Windows.

The unit will be based on a prototype that is being tested in the market. The prototype measures 120 by 245 by 30mm and houses a monochrome screen. It sports 700K bytes of RAM and a 2.4K bit/sec. modem, the spokesman said. NEC didn't say which processor the prototype uses.

In addition to software for E-mail and online connectivity, the machine will come bundled with several basic business applications.

Guth is Tokyo correspondent for the IDG News Service.





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Computer Industry

The boom ends

Inevitable PC sales slowdown causes chip maker layoffs

By Melissa Bane

Slumping PC sales stung two chip makers last week, and analysts warn that it could be a full year before that market picks up significantly.

Analysts said the slowdown was inevitable in a market that boomed during the past few years. And the slow migration to Microsoft Corp.'s Windows 95 has compounded the problem, they added.

National Semiconductor Corp. and Advanced Micro Devices, Inc. last week took steps to adjust their workforces, blaming sluggish PC sales.

"I think [this year] is going to be a very flat year for PCs in general," said Jim Turley, editor of "The Microprocessor Report," a newsletter in Sebastopol, Calif. "Christmas '97 will be good and maybe spring '97, but this year is going to be fairly dreary."

Buyers won't make another round of purchases until the next family of chips comes out, Turley said. And because Intel Corp. doesn't plan to release any substantial upgrades to its chip line before the end of this year, the market won't see any major changes until then, he said.

Several analysts agreed that it will take three-dimensional graphics-enabled chips, such as Intel's multimedia-enhanced Pentiums, to kick some life back into PC sales. These chips are due by the end of this year and will include Intel's MMX technology, which can better handle graphics and multimedia programs.

The big boost will come from the home market, said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz. Demand for graphics will increase in line with wider adoption of the Internet, he said. Corporate buying tends to be more utility-driven than consumer purchases, but corporate buyers will also be driven by graphics and multimedia capabilities, McCarron said.

In the meantime, analysts said, PC product manufacturers must learn to adjust.

AMD did just that last week by enacting a hiring freeze on its 13,000-employee workforce. The news came after company officials predicted weak first-quarter results, which echo first-quarter estimates announced recently by companies such as Compaq Computer Corp., Digital Equipment Corp. and IBM.

AMD also announced a mandatory eight-day summer vacation for employees.

But while AMD blames its problems on a drop in PC sales, it has had other troubles, McCarron said. "For AMD, it's a combination of factors. Part [of it] is the fact that they couldn't make the transition between 486-class and fifth-generation chips well enough."

National Semiconductor, meanwhile, will lay off 400 of its 21,000 workers. The move will cost the firm $20 million to $25 million.

Turley said he is more skeptical that National Semiconductor is passing its problems off on the PC sales drop because the firm is much more broadly based. But Turley acknowledged the drop in PC sales could be having some effect.

Intel no longer has the Pentium market to itself. See page 45.

Briefs

More DEC layoffs

Digital Equipment Corp. last week confirmed a layoff of 500 employees from its Multivendor Customer Services unit. The unit, one of Digital's most profitable divisions, had been largely untouched by downsizing.

IPOs wake up Wall Street

Initial public offerings (IPO) from Lycos, Inc. and Lucent Technologies, Inc. stirred up Wall Street last week. Shares of Lycos, which operates an electronic directory of the Internet, opened trading at $29.25 per share — $13.25 over its IPO price — before closing down at $21.94. Lucent, AT&T Corp.'s equipment maker spin-off, sold 112 million shares at $27 each, making it the largest IPO in U.S. history.

SHORT TAKE Amdahl Corp. last week paid $145 million for **Trecom Business Systems, Inc.** in Edison, N.J.

Sybase pins hopes on System 11

Struggling RDBMS vendor sees $9M first-quarter loss

By Dan Richman

Sybase, Inc. last week ousted its chief operating officer and said it will suffer a first-quarter loss, but users and analysts said the company finally has the products to turn things around.

Sybase warned it will lose up to $9 million on revenue of $245 million when financial results are announced Thursday.

Dave Peterschmidt, who has headed company operations since 1990, will step down to consult. Executives who reported to Peterschmidt will report to Mark Hoffman, CEO, chairman and president of the company.

Sybase has taken a beating lately. Last year it posted a first-quarter loss and minuscule profit each quarter thereafter. Version 10 of its flagship SQL Server relational database management system was widely derided by users, who said it scaled poorly and was therefore unsuitable for company-wide use.

Analysts at Gartner Group, Inc. in Santa Clara, Calif., noted "a significant shift in the DBMS power ranks," with Informix Software, Inc. taking the lead in revenue growth. Informix had trailed Sybase and market leader Oracle Corp.

But users said Sybase's product line has been strengthened with the December release of the System 11 product family.

"Sybase databases work, which is what matters to me," said Lew Chaney, systems manager at *The Sacramento Bee* in Sacramento, Calif.

"The users I talk to still believe in Sybase and have high hopes for SQL Server 11," said Sherm Weinberg, immediate past president of the Great Lakes Sybase Users' Group in Chicago.

"Though this isn't good news for Sybase, from what I'm hearing, Sybase's products are now solid, and those are just starting to roll out," said Donald DePalma, a senior analyst at Forrester Research, Inc. in Boston.

He speculated the bad quarter was caused by "a sales pipeline clogged with burned Version 10 users and cautious, would-be Version 11 users waiting to see how the early adopters fare."

DePalma cautioned that Sybase's marketing needs a lot of work if the company is to flourish.

"Sybase must stop marketing to technocrats and put SQL Server 11 into a broad market," he said. "Sybase has to get into people's faces, and the old guard just didn't do that."

Mitchell Kertzman, newly appointed executive vice president of sales and marketing, vowed to change Sybase's marketing approach.

"We've been a whipping boy for the last 18 months, and I'm going to put a stop to that. We used to be a company with one product, SQL Server; one channel, direct sales; and one customer, big companies. Now we're far bigger and complex, but we've never articulated who we are."

CEO Hoffman minimized the quarterly loss, noting that it represents less than 4% of revenue. "We're in the earliest part of a very rich product cycle, and I'm very optimistic," he said.

He said SQL Server 11 is selling "great, getting a very positive reaction" but sales figures weren't available.

SQL Server 11, released in December, is regarded as a high-quality, scalable piece of code that remedies prior shortcomings. Version 5 of the PowerBuilder development tool, announced in February, has gotten good reviews from beta users. And Sybase IQ, an analytical engine, handles queries with speed and technology no other vendor can match.

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Baby Bell megamerger

Merged Southwestern Bell/PacTel would be second to AT&T

By Lisa Picarille

Telecommunications

Wedding bells for the two smallest Baby Bells may ring in an era of expanded telecommunications services for users.

In the fourth-largest merger on record in the U.S., SBC Communications, Inc. and Pacific Telesis Group plan to create the nation's second-largest carrier behind AT&T Corp.

The company will have $22 billion in annual revenue and 36 million customers in California, Texas and several other states.

Brian Adamik, an analyst at The Yankee Group in Boston, said the merger will result in more products for consumers and businesses.

"This is a merger of scale," Adamik said. "Clearly these companies want to offer a broad portfolio of services, including phone, cable, wireless, cellular, video and Internet access. To accomplish those kinds of goals and compete with AT&T, you have to be big."

The $17 billion deal comes two months after Congress passed sweeping legislation that allows the regional Bell operating companies to enter the long distance telephone business.

Although last week's Southwestern Bell/PacTel merger is the first megadeal since telecommunications reform, other regional telecommunications providers, including Bell Atlantic Corp. and Nynex Corp., have been holding merger talks.

Observers said the mergers are an attempt to compete with national long-distance giants such as AT&T, MCI Communications Corp. and Sprint Corp. The merged company will be called SBC Communications and will be based in San Antonio. The 100,000-employee company will be headed by Edward Whitacre Jr., SBC's chairman and CEO. Pacific Telesis chairman and CEO Philip Quigley will become vice chairman.

The merger, expected to be completed by year's end, is expected to face scrutiny from the U.S. Justice Department, the California Public Utilities Commission and the Federal Communications Commission.

The regulators will try to determine if the merger would reduce competition for local phone service.

New switches bow from Xylan and Agile. See page 63.

Prodigy managers seek buyout

By Mitch Wagner

Top managers at Prodigy Services Co. were pounding on Wall Street doors last week, exploring a management buyout of the on-line service from its parents, Sears, Roebuck and Co. and IBM.

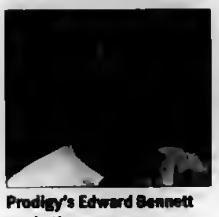
Sources close to Prodigy said company President Edward Bennett hopes to raise $500 million to $600 million to buy the company, which has the third-largest subscriber base of any on-line service.

News of the potential buyout comes as Prodigy, based in White Plains, N.Y., struggles to catch up with larger competitors after failing to catch the recent wave of popularity in the Internet and on-line services.

Prodigy membership increased just 17% last year, to 1.4 million. By comparison, competitors America On-line, Inc. and CompuServe, Inc. each saw membership more than double last year; the services reached 4.5 million and 4 million customers, respectively.

Prodigy has announced plans to lay off about 100 of its 680 employees.

"If this kind of major overhaul finally helps them pull back up after years of going downhill, then, absolutely, I'm in favor of it," said Andrew McGibbon, webmaster at New York-based Playbill, Inc., which sponsors content on Prodigy.



Prodigy's Edward Bennett *and other managers are said to be seeking the means to buy the company*

Sears announced in March that it plans to sell its 50% stake in Prodigy, and IBM said it is considering its future role with the on-line service.

Prodigy wants to redefine its role in the on-line service arena. Instead of creating and owning all its content and providing sole access to it, the company is seeking more relationships such as the one it has with Playbill.

But uncertainty about Prodigy's future has made it difficult for the company to cut deals with firms to sponsor content, said a company insider who requested anonymity.

Prodigy is also pursuing partnerships with media companies and banking and financial firms, said Chip Austin, vice president and general manager of Internet services at Prodigy.

Last June, Prodigy announced plans to phase out the proprietary formatting technology used to display images and text on-line. It is rewriting the service in Hypertext Markup Language, which is used on the World Wide Web. That work is about 70% complete.

A Prodigy spokesperson declined to comment on the management buyout plans.

The Web and IS. See page 73.

AT&T may choose 'net over proprietary on-line service

AT&T is studying whether to discontinue its proprietary on-line service PersonaLink, a small chat and information network aimed at consumers.

That's because the Internet, rather than proprietary networks, is AT&T's on-line future, a spokesman for the Basking Ridge, N.J., telecommunications firm said.

"The Internet is the basis for our on-line strategy, [and] we're taking a look at how PersonaLink fits with that," he said.

AT&T recently switched gears on another of its proprietary services called Interchange. In January, the company started migrating Interchange to the World Wide Web, saying it was a more open medium for on-line users [CW, Jan. 22].

AT&T gave notice last week to 140 Cambridge, Mass.-based employees — half the staff — of AT&T New Media Services, which operates Interchange. One hundred of those employees will be laid off as of June 2; the remaining 40 will remain to close down the service.

The spokesman declined to say how many subscribers the 19-month-old consumer service has, except to say "it's a modest number." Analysts suspect the numbers are underwhelming.

American Online, Inc., the most popular on-line service, claims 4 million to 5 million subscribers. Meanwhile, Prodigy Services Co., which co-owners IBM and Sears, Roebuck and Co. are looking to sell, has 1.4 million members.

"We would hope to have a decision soon. It's not in our interests to linger," the spokesman added.

—Kim S. Nash

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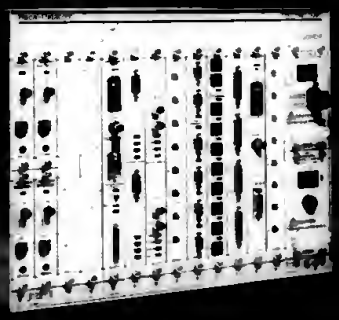

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Client/server lives

Well, thank goodness we have a fresh victim. Step right up, client/server technology, and receive our heaps of scorn.

After years of listening to relentless cheerleading from vendors, the press and random pundits, users are now being urged to start booing this complex, expensive and unwieldy stuff.

If client/server isn't actually dead already, we're bored to death with it, right? All that tedious talk about paradigms and infrastructures and three-tier architectures. We could probably make a case that client/server was to blame for exonerating O.J., too.

Even in the holiest places of tech-worship — the recent Database & Client/Server World show in Boston — a lineup of industry know-it-alls could be found gleefully trashing client/server and lionizing the Internet and the World Wide Web.

Like the 'net and client/server have nothing to do with each other. Like the 'net isn't one of the most obvious examples of client/server technology in action today. The underpinnings of the Internet are a multitude of disparate hardware platforms, operating systems and applications — all working on top of layers of standard protocols.

What's happening among the "client/server is dead" crowd is a binary sort on technology: a black-or-white, love-it-or-hate-it approach that highlights the short attention span of this industry. But the people in the trenches — the information systems managers, the software developers, the database administrators and the network pros — aren't buying it.

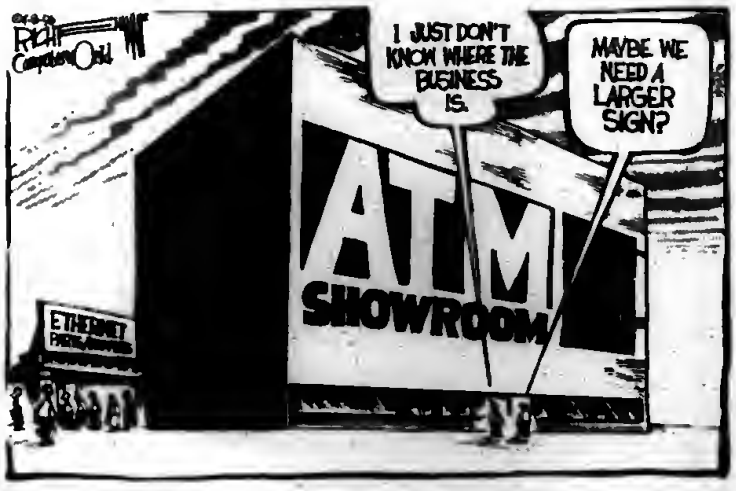
IS folks know better than anyone that technologies don't really die. They just evolve. Client/server isn't competing with the Internet; it's enabling everything that happens on the Internet.

The wondrous Web itself is built on standard protocols — and it flat-out couldn't exist without years of Internet and client/server evolution behind it. But tell that to my fifth-grade daughter, who's busy assembling her own Web page these days. She doesn't have a clue about all that history. She's just pointing and clicking her little heart out.

Of course, she's not building a financial system to run a chain of regional banks. So she's not worrying about pesky things such as security — other than the kind that keeps her sister out of her room.

Client/server? She's never heard of it. Come to think of it, she'd make a darn fine industry pundit.

Maryfran Johnson, *Executive Editor*
Internet: *maryfran_johnson@cw.com*



Paradigm shaft

It was interesting to read Charles Babcock's column declaring the death of client/server ["Client/server is dead; long live the intranet," CW, March 11]. Coincidentally, Stewart Alsop's article in *Infoworld* of the same date announced that the mainframe lives. The new paradigm now seems to be enterprise servers and the Internet.

After all that effort of blood, sweat, tears and years in moving to client/server from the mainframe, does it mean that all those people got out of it was a paradigm shaft?

Joseph S. De Natale
Wellesley, Mass.
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Unfair comparison

On behalf of Computer Sciences Corp., I strongly challenge the assumptions underlying your recent survey of the largest 25 systems integrators ["The good, the bad and the ugly," CW, Feb. 26]. Your survey mixed network integrators, hardware integrators, packaged software integrators, business change consultants and outsourcers. The information technology professionals who make up your readership selected the first three kinds of firms and probably had the latter two selected for them by senior line management. It is is their interest to have their own choices succeed.

A fair survey would rank large companies such as CSC by "tiers," based on internal clients, as well as by project complexity, size and duration. For example, a survey of line management satisfaction with business change projects could be linked to a survey by information technology professionals who specifically called in systems integrators.

A whole separate analysis might focus on "life after being outsourced — who treats information systems professionals best?"

Robert Gilbert
Director, commercial public relations
Computer Sciences Corp.
Cambridge, Mass.

Quickly forgotten

You know you have been programming a while when *Computerworld*, one of the premier newspapers in the IS world, has to define a 1401 computer ["The last laugh," CW, March 18].

In today's terms, I think that would be equivalent to having to define a Macintosh (or a PC?) 40 years from now.

Joel Tanenbaum
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Purchase, N.Y.
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Example schools

I read with great interest the article "IS schools: Need improvement" [CW, Feb. 19] and couldn't help but agree that many programs need to focus on industry needs. However, it would have been nice to see some focus on those schools that do an excellent job in meeting those needs.

For instance, Nova Southeastern University has graduate programs that blend the role of information systems and industry. This approach allows working IS professionals to work directly with industry and apply theory.

The article also neglected community colleges. Many of these two-year schools focus their training on the needs of industry. Community colleges will also often provide continuing education courses for working professionals, taught by professionals, at a fraction of the cost of industry training. Wake Technical Community College in Raleigh, N.C., offers full-term continuing education courses in Visual Basic, object programming, C and others at a cost of only $40 per course.

Introductory IS courses need to focus on developing mainstream programming skills, understanding IS technology and applying these skills. Advanced IS education should then focus on true software engineering.

A good IS bachelor's degree should tell employers that the candidate is able to apply engineering-level discipline to build quality systems. The goal should be to alleviate trial and error.

Industry training and programming courses can make nearly anyone a programmer, but not every programmer is trained in using a well-rounded suite of sound system development methodologies.

John R. Wetsch
Raleigh, N.C.
7417775@mcimail.com

More letters, *page 40*

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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(b) Netwark (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

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Verbatim

From a Computerworld Canada interview with Doug Michaels, chief technology officer at SCO, Inc.:

Q: Tell me why [Microsoft Corp.'s] Windows NT isn't going to wipe out Unix tomorrow.

A: I think there's a million arguments supporting why Unix is better technically.

But the overwhelming, compelling issue is expertise.

It took us more than 10 years to get enough Unix programmers in the industry with some experience and knowledge of what works and doesn't work. We had the advantage then that every university in the world was teaching Unix as the core of its computer science curriculum.

NT is a radical departure. It's a whole new computing model. It's got some really interesting and exciting ideas, many of which I'm sure will find their way into Unix and other platforms.

But ... how do I deploy a mission-critical system with hundreds of users, and what will reliably work in the field?

There's nobody who knows.

Try and find a project manager with even five years of NT experience implementing complex solutions. I guarantee you it can't be done.

Yet nobody would conceive of implementing a major $5 million project based on a project manager with less than five years experience who hasn't done another project like that before. You wouldn't.

You're not going to see a mainstream conversion to NT in less than 10 years, even if it were the perfect answer and in every way better.

NT has a few new options that aren't yet available on Unix. But for most development people and IS departments, those new options aren't an option because there's no way to model them; there's no way to predict their performance; there's no experience base.

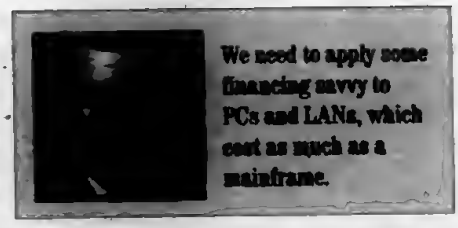
Even if you had all that, where would you find anybody to do it?

Leasing: Not just for big iron anymore

Sam Albert

Leasing. It's a word normally associated with cars, truck fleets, jets, heavy machinery and mainframe computers. The word isn't usually associated with PCs and LANs.

But we're all learning the hard way that distributing PCs and LANs enterprisewide is just as costly as running a data center full of big iron. For example, I know of a 2,000-employee company that plans to spend $2.5 million on PC hardware — the equivalent of a small mainframe. A Gartner Group study estimates that a PC costs five times its purchase price during its useful life. That company's $2.5 million purchase will really cost $12.5 million.



We need to apply some financing savvy to PCs and LANs, which cost as much as a mainframe.

Given the life-cycle costs of PCs and LANs, maybe it's time to apply the acquisition savvy we used for mainframes to this amorphous entity called client/server computing. That's especially important as companies place mission-critical applications on Unix-, Windows- and OS/2-based distributed systems.

The issue of how you finance that client/server system is growing in importance for both chief information officers and chief financial officers.

IBM Credit Corp. was one of the first to recognize this need for financing options and asset management. It responded with an array of product-specific financing packages, such as the PC Exchange Lease for desktop systems and below-prime interest rates on PC servers and ThinkPads.

The advantages of leasing go beyond controlling acquisition costs. The four main benefits of leasing systems are the following:

- Leasing acts as a hedge against technological obsolescence. When the term of a 3- to 5-year lease expires, companies can extend the lease if the equipment still is viable, upgrade to new technology, buy the equipment outright or end the lease and change to a new system. The beauty of this is that the customer uses the technology to satisfy business requirements without owning it.
- Leasing offsets one-time capital expenditures, which allows companies to pay for equipment over time and for only its useful life.
- Leasing gives accountants tax-reducing tools (such as off-balance-sheet financing) and simplifies depreciation issues.
- Leasing provides financing options for the complete client/server system — even if the hardware comes from several vendors. The financing package can extend beyond hardware to cover software and maintenance, the training of end users, network installation and service contracts. This "complete financing" gives the CFO a clear picture of the system's cost and the CIO a full picture of all the technology assets.

There is a downside: Leasing may force CIOs to forfeit some power to CFOs. But in the big picture, that's preferable to delegating technology decisions to far-flung department managers and losing all control.

In today's corporate environment, where controlling costs concerns everyone, user companies stand to gain from weighing all the options — including financing alternatives — when acquiring PCs and LANs.

Even IS managers who are unaccustomed to heavy number-crunching can easily manage a well-structured leasing agreement.

Whether your IS department reports to the CEO or the CFO, you'll enhance your political standing by boning up on finance options. There's no reason an IS department can't be an asset manager instead of a black hole for corporate cash.

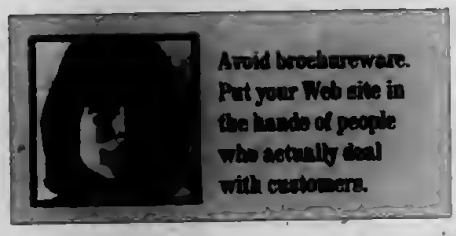
Albert is an industry analyst and president of Sam Albert Associates in Scarsdale, N.Y. His Internet address is 4454496@mcimail.com.

Don't let PR control your Web site!

Patricia B. Seybold

One of the biggest mistakes you can make when building your World Wide Web presence is to give the corporate public relations department control and ownership of your Web site.

Why? Because they'll turn it into a boring corporate brochure. A few investors may be interested in on-line versions of your annual report and the corporate backgrounder. But customers aren't.



Avoid brochureware. Put your Web site in the hands of people who actually deal with customers.

Instead, think about the compelling business reason that drove you to build a Web site in the first place. Are you using the Internet to save money, improve customer service, shorten time to market or transform your distribution channels? Give control of the Web site to the folks closest to the action.

American Airlines learned this lesson quickly. The corporate communications department in December 1994 was planning to lead the design and deployment of the airline's Web site. It posted the usual corporate fluff.

But John Samuel, director of distribution planning — the folks responsible for selling tickets — had a better idea. Samuel wanted a Web site that customers would find useful and that would reduce the company's customer service costs.

American Airlines spends millions of dollars each year staffing its toll-free customer service lines. But a large percentage of the calls that come to the call center aren't booking-related. People ask for information such as how to get from the airport to downtown or how to travel with a pet. They ask questions such as, "Can I take my skis?" and "Where's the Admiral's Club at the Dallas airport?"

Samuel realized that many of American's wired customers would prefer to help themselves to the information they need, rather than call in and possibly wait in a queue to get answers. He formed a team to focus on serving customers via electronic channels, and the team developed a separate Web site.

American opened for business on the Web last May at http://www.amrcorp.com. It posted at first much of the travel-related information that people called the telephone centers to get. This included airport logistics, seating charts, a list of in-flight movies and the locations of city ticket offices.

By last July, you could also get flight departure and arrival times, which were updated every 30 seconds from the company's main computers. American gave frequent fliers the ability to check the status of their AAdvantage accounts and awards. And the airline is adding on-line booking and electronic ticketing for flight reservations.

So is this alternative information distribution strategy working? Samuel claims that the proof came during the blizzards in the Northeast this past winter. Traffic to the Web site increased 40%; hits on the page of flight schedules shot up 400%; and ticket sales were up for the same period. American discounted its fares last month. Again, traffic to the Web site went through the roof.

So before you invest another nickel in your Web site, take a good look at the business strategy it supports. Do you have a clear, focused plan that saves money, improves customer service or expands your audience by using the Web?

If not, you might as well leave your Web site in the hands of the corporate PR department. But don't expect to reap any tangible rewards.

Seybold is president of Patricia Seybold Group in Boston. Her Internet address is pseybold@psgroup.com.

Microsoft

NT TO

After years of making messaging richer for users, someone has finally made it more reliable for you.

[redacted]

CONTINUED FROM PAGE 36

Offshore software development hits home

In your In Depth piece on offshore programming [CW, Feb. 26 and March 4], I heard no mention of the geostrategic and internal social/political situations that can have significant impact on business.

A recent *New York Times* series said 70% of workers compete more with coworkers, while 20% cooperate. Add our domestic political turmoil over jobs and international trade and immigration policy, and you have important considerations that need to be factored in to the decision process.

My experience as s controller in crisis decision exercises/wargames and the study of geostrategic events has shown you don't easily cleave the economic events from the rest of the equation.

Frank Alla
Newton, Mass.
fvalla@world.std.com

"Look before you leap" hit the nail right on the head. The company I work for outsourced a major software project two years ago and has run into many of the problems in the article.

Project management and leadership suffered due to lack of communication. Our foreign programmers agreed to everything we said, not wanting to tell us that our expectations could oot be met. We have paid the price many times over. At this writing, our project is over budget and behind schedule. Our original software contractor is no longer working on the project, and we are looking for someone to come in, clean this up and get the project moving forward again. Any takers?

James Thomas
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As you rightly point out, cost is oot the prime criterion for going offshore for software development. The key is the ability of the Indian vendor to deploy rapidly s large team of technology-relevant talent that can help a company meet the deadline.

Having successfully delivered a large number of high-value solutions from the competency centers in our group in India to several leading technology giants in the U.S., I can state that offshore outsourcing has become s mainstream strategic weapon to lend these companies a critical competitive edge.

Shiv Kumar
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nts@hclae.com

While I agree that programmers need to continually update their skills, bow can companies make the leap of faith to ship s project overseas wheo most of them still don't allow their own workers to telecommute around the corner? This despite the workers' having better, faster compoter equipment at home.

John Gay
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Sorting out the Java/intranet vs. SAP premise

The Viewpoint column in the March 11 issue titled "Intranets: The SAP-killer?" could not be more appropriate. I agree with much of what the authors say about SAP. However, their conclusion totally me.

Client/server computing is now a decade old. In this decade, the software industry and IS have not proved that client/server is a viable technology for all but departmental-size applications. Unfortunately, coupled with the prodding of hardware and software suppliers, internal IS people started rebuilding all their major systems using this technology. Some succeeded. In most cases, as [authors] Ravi Kalakota and Andrew Whinston correctly stated, the complexity stymies deployment. This is true not only for SAP, but also for most all client/server applications.

I depart with them on their rosy assessment of Java and intranets. Java is an infant product running in infant intranet environments. No one has implemented a complete data processing application with Java yet. No company's data processing environment relies on intranets. To posit this combination as the next great computing wave just compounds past mistakes made because of the love of new technology.

Last summer, the hype level of Windows 95 started me thinking once again about why companies really buy computers. I now firmly believe that too much technology is crowding out the real reason businesses buy computers: increased productivity.

I fail to see the connection between making businesspeople more productive and plunging into Java and intranets now. There may be many sexy Java demos around. However, a few sexy demos don't a technology make.

Max Rosenblatt
TaPiz Associates
Lincoln, Mass.

The commentary by Ravi Kalakota and Andrew Whinston mischaracterizes the potential for a collection of intranet objects to replace complex client/server environments such as SAP's R/3.

It's not just a matter of whether the technology is out there; it's also of who makes it. The applet world is not a stable business software development environment.

Are we to believe that all those applet-savvy programmers are soon going to write the code that manages multibillion-dollar corporate systems? Hardly.

SAP is a success not because of its technology but because of its connection to the real world of business requirements. The next wave of applet-based R/3-like software is going to be designed by the companies that are in the best position to kill the current version of R/3: SAP and its competitors.

The companies I've met that are selling applet-based technology are light-years away from understanding the functional issues that make up the real reason why SAP is a strong sell in the corporate market.

Joshua Greenbaum
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Hurwitz Consulting Group and
Sentry Market Research
Berkeley, Calif.
josh@ix.net.com

Kalakota and Whinston are on track that Java and intranet have set the stage for a whole new breed of application, but they're a bit off to claim that Java applets will be far less costly than integrated systems such as SAP R/3.

SAP, Baan, Oracle and others have invested hundreds of man-years into the development of these application systems. Building an integrated manufacturing system in-house that rivals that functionality would take years.

There will always be a market for purchased application systems. But the vendors need to adapt their systems to work with the Internet. But never fear. It's happening. Did anyone else notice the article on page 4: "SAP AG boards 'net bandwagon"?

Anne Thomas
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Open Environment Corp.
Boston
anne@oec.com

MEDICAL ALERT...

Unix Programming Suspect in Wave of Migraine Headaches

Stop beating your head against unusable tools! Instead, use mainframe-style tools on Unix for immediate productivity.

uni-SPF ispf-style Editor, Browse, Utilities, ... even Dialog Mgmt!

uni-REXX Portable System Control and Macro Language

uni-XEDIT cms-style Editor with Full Macro Support

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com

IS should seek quality, not a magic answer

In the March 4 issue of *Computerworld*, Patricis Seybold addresses "The sorry state of systems management." I agree with virtually everything she said. Seybold has described a very unsatisfactory set of outcomes.

However, I believe we must take a further step back in order to understand the underlying cause.

Management in information systems continues, even after all these years, to desperately grasp for that one piece of hardware or software, open systems platform or suite of operational management software that will solve all problems. As ever, "There is no silver bullet."

Our experience has shown that total dedication to quality is necessary to correct the conditions Seybold describes. A focus on prevention, rather than the endless search for the magic answer, is required.

Unfortunately, most of the organizations that profess quality operations still focus on "after-the-fact" techniques rather than creating and supporting the nurturing working environment necessary to achieve high quality. This is the most significant problem in IS today.

R. K. Aeh
Cincinnati

There's nothing more critical to your business than your competitive advantage

Texas Instruments

But the IT organization has problems of its own

It is often unable to respond to the speed of change, because existing systems have been developed using techniques that are unable to rapidly adapt to today's changing business needs. Consequently, when systems are delivered, they are often late, do not reflect current requirements and cannot be updated without significant amounts of reengineering.

By exploring such issues as model-based development, component-based development, rapid application development and reuse in its broadest sense, we hope you will understand why we firmly believe that to retain your competitive advantage, you need to ensure your company's business rules can and should change independently of the underlying technology.

"Businesses increasingly look to their information systems to provide them with a unique competitive edge.

This competitive edge will be provided by systems that deliver useful, up-to-date, reliable, consistent and accurate information to the business - in a world of constant change."

How?

How can you ensure today's client/server systems are not tomorrow's legacy systems?

■ There has been a recent backlash against the notion that small client/server systems, developed rapidly using tools that support individual workgroups, are the answer to every business need. Managers have found that tactical approaches used inappropriately lead to even more legacy systems, even greater skill and resourcing problems and inconsistent applications that actually inhibit future business flexibility.

The key issue for business and IT managers today is how to evolve their portfolio of core business systems into new technologies, such as the Internet, achieving a sensible balance of quality, speed and flexibility, delivering applications which meet the business needs now and in the future. We will examine how model-based development, supported by Composer from Texas Instruments Software, provides an environment for application developers that supports this balance of quality, speed and flexibility. And how some package vendors deliver real flexibility to their customers using these techniques.

■ **Beyond little client/server**
Page 6

How?

How can a package provide the same level of flexibility as a custom-developed application?

■ A common response to reducing the risk involved in acquiring information systems to support the business is to acquire a specific package. Packages are considered valuable, because it is believed they can be deployed quickly to support well-defined business functions, such as payroll or general ledger. But when they are applied to other areas, business is forced to accept a less than optimal solution, because organizations must change their business process to the capabilities of the package. It is difficult to modify packages to enable organizations to capitalize on unique business opportunities that provide that elusive competitive advantage. In fact, custom-built strategic applications are essential to maintain a competitive edge.

■ **Looking at packaged software in a new light**
Page 10

How?

How can you shorten the application delivery lifecycle?

■ Focus on speed of delivery alone and you will deliver low quality results in less time. The very latest approaches to rapid application development enable fast delivery of complex applications with exceptionally high quality. Although business users require prompt delivery of their IT support systems, they demand higher and higher levels of business support.

Very often the primary business driver is the time to market of new products and services. The IT systems required to support these new products or services are usually on the critical path to meeting new business demands.

■ **Shortening the delivery lifecycle**
Page 11

What?

What is the most effective way of extending the application development footprint?

■ The manufacturing industry long ago learned about the benefits of moving from custom development to assembly from prefabricated components. First, they reduced costs and time to market by building from pre-built, ready tested components. Second, they added value and differentiation to their products by rapid customization. Since this approach has suited industries ranging from building construction to electronics, it can now work for software applications. We call it, Component-Based Development (CBD).

■ **Assembling applications from components**
Page 12

Beyond little client/server

■ How can we ensure today's client/server systems are not tomorrow's legacy systems?

Many organizations are beginning to derive real business benefit from developing IT systems on client/server platforms. They attribute this success to their ability to deliver systems rapidly using modern, highly graphical desktop development tools. But will they prove to be sufficiently robust and maintainable to support the business now and in the future? Or are they simply tomorrow's legacy systems? Two factors are crucial. First, is the need to maintain independence from any underlying technology. And second, is the need to use tools and techniques that will enable systems to be built that are sufficiently robust to be used enterprise-wide. It is crucial that these applications are able to adapt and scale up as the needs of the business change.

■ How can we build more flexibility into client/server applications?

Consider your reaction if you were able to deliver integrated applications in half the time it takes using conventional development approaches and also deliver high-quality, high-performance applications that are inherently easy to modify and maintain. You can with an advanced model-based development environment, such as Composer from Texas Instruments Software.

"Composer takes away all the difficulty of the communications and coordination between the developer of the client and the developer of the server procedure. You can have one developer developing the client and the server with Composer. It's a big advantage."

Vincent Ducrot
Schweizerische Bundesbahnen (SBB)
(Swiss Railways)

Model-based development

■ Model-based development separates the business concerns from technology and enables high levels of reuse of both the specification and execution components.

■ Business level specifications are independent of technology

In model-based development the application specification is defined as a technology-independent business model using a series of diagramming tools. For example, consider a model of the business rules and data collected when recording a sales transaction. Most of these rules and the data are the same whether the transaction is made in a store on a point-of-sale system, entered into an on-line telesales system or executed independently by the customer over the Internet.

In an advanced model-based development environment, such as Composer, the specification of the system is stored in a repository as a model of the business. So, when changes are made in the business, these can be quickly reflected in the specification and a replacement component generated.

Composer uses a highly graphical approach. Each of its diagramming tools provides a specific view of the complete specification which is captured in the repository. Together, all the views are integrated to provide a complete business model that can be rapidly built in an iterative manner, with overall consistency and integrity coordinated through the repository.

■ **Specification - a guaranteed fit**

In Composer, model-based development should not be looked upon as a collection of separate tasks, but as different ways of entering and viewing business object information. As each view is from the repository, it ensures a guaranteed fit between the information entered through each of them. This reduces errors as no translation or re-keying of data between views is required. It also means that the specification exactly matches the execution code, making maintenance dramatically simpler.

■ **Moving on to system design and implementation**

The business level view focuses on what the business does. The design level concentrates on how to accomplish these tasks within the business. The design level is concerned with two areas - external design or what the user sees, and internal design, including database structures.

■ **Automated system production and deployment**

Coding and deployment of the business system is technology dependent. But the model-based specification provides all the details necessary to enable the application components to be automatically generated, including the source code, the database and the communications components.

The good news for business and project managers is that the model-based development approach facilitates a quantum improvement in application development performance, both in the delivery and maintenance phases.

Repository - the essential enabler

■ A repository is simply a database that knows the structure of applications. It knows about all the software components from which applications are composed. It knows about the business models from which the applications were derived. And vitally, it knows the relationships between the components. It is this last capability that places the repository into a pivotal role in the application management process.

Developers use the Composer repository to store all elements of design. It consists of descriptions of an application's components, such as business process logic, business events, object types, program interfaces, database schema, etc. The main role of the repository is to assist application designers to share information. To do this, it supports version, configuration and relationship management. Composer's repository provides an environment to support everything from the smallest workgroup to the largest enterprise. It enables numerous integrated applications to be coordinated, sharing specification-objects and executable-objects and achieving a very high level of reuse and consistency.

Leading edge repositories that store all the specification components necessary to automatically generate 100% of an application also provide the very highest level of automation for the developer. Each item of knowledge is stored only once, and the relationships between different views are well defined.

■ **New developments in repository technology enable component-based development**

Repository technology is the primary driver of the next important evolution in IT; it enables the widespread deployment of components. The next evolution in repositories will focus on increasing levels of openness and application run-time support. This will enable IT departments to provide business users with access to components without the need for assistance from technical specialists.

Modular architecture for real-world flexibility

■ One of the key aspects of client/server development is the distribution of the parts of an application, such as the database, user interface and business logic. Applications consist of many parts, and the challenge of client/server development is that these parts are distributed between the server and its clients. Good programming practice has always encouraged a modular approach. But this becomes critical in delivering client/server applications because the parts are separated physically as well as logically. Many organizations are faced with distribution of these parts across very complex client/server environments with many different platforms, databases and networks. And they need to allow it all to change to keep pace with rapid technological evolution.

With the client/server model, the natural layers of the application, if developed independently, provide isolation from technology change. For example, changing networks should be straightforward if middleware is used to connect the client and server together. Changes in the user interface should only affect the user interface code. And new software or hardware can be introduced without having to change the entire application.

Break free from technology

■ Composer's approach to system delivery and deployment is based on 100% system generation directly from business-level specifications. This provides organizations with a vast degree of choice when it comes to the technology they choose to run the application. Composer's list of supported platforms, operating environments, database management systems and networks (shown right) is truly impressive.

"We train our staff in Composer - we don't have to train them in six different technologies. We don't end up with a fragmented sort of staff where we have one expert in one tool, a different expert in the other tool and a third expert in a third tool. Instead, each of our development people can basically do the whole job with Composer. It's a very powerful concept for us."

Steve Vance
Travelers Insurance

Netting the benefits

■ Internet application capability

In its simplest form, the Internet can be viewed as a wide-area client/server system. For business users, the Internet represents a powerful application tool.

Web-style client/server applications are usable as inter-company applications using the Internet or as internal applications commonly termed 'Intranet.' The Intranet applications utilize the internal corporate network as the network between the browser and the servers, delivering the same look, feel and benefits of external Internet applications.

Developing for multiple client platforms is easier with Web-style clients, since the pages and software downloaded by the Web browser are client platform independent.

In the same way mainframe customers were able to adapt Composer applications to conventional client/server applications, existing server applications will be accessible as Web pages on the Internet, integrating a new and innovative client into customers' overall client/server architecture. Most Composer users are in the unique position of having implemented an application architecture which separates business logic into server-business objects or components. By isolating the client type from the server-business objects, the different types of client can be used to access dynamic server-based information.

Texas Instruments Software is working to bring tools and solutions to allow its customers to develop Web-based applications delivering Internet for the Enterprise.

Communications infrastructure

■ An essential component of any architecture supporting large-scale client/server systems is a robust and flexible communications infrastructure. The communications infrastructure provided by Composer supports a wide range of platforms and protocols transparent to the developer, including transaction processing protocols, such as CICS or Tuxedo.

Composer also supports:

- Internet
- Native protocols, such as LU6.2, NetBios and TCP/IP
- Database protocols like SQLNet
- The PIPES middleware product from PeerLogic

In a complex network, it is not unusual to have a combination of two or more protocols. With Composer, changing or adding new protocols does not require the entire application to be modified or rebuilt. Simply make the appropriate change to the model and regenerate the affected parts.

In order to manage the growing complexity of enterprise-wide networks, organizations are looking to implement communications infrastructures based on the higher levels of service provided by products, such as the OSF's DCE and IBM's MQSeries. Texas Instruments Software is opening up the communications interface to Composer, enabling customers to use the interface of their choice. This approach allows organizations to select the most appropriate communications infrastructure.

Organizations will be able to realize the benefits of Composer-developed applications knowing that the applications will co-exist in a highly flexible manner with the chosen infrastructure. As distributed client/server technology evolves, Composer will allow the initial adoption of a particular infrastructure, insuring it can be changed progressively over time as distributed client/server technology evolves.

In fact, current Composer customers are already redeploying their Composer-developed applications using the Internet as their communications alternative. Since Composer users design and develop applications without having to make firm decisions about the operating system and hardware platform, the same level of technology independence is provided in the distributed communications area of the products.

Looking at packaged software in a new light

■ Many IT organizations are faced with pressure from the business to acquire and manage an 'off-the-shelf' package to support a specific business need. The perception is a package will generally provide a fast solution, and it is usually the best option for automating a well-defined, non-competitive business function, such as payroll or general ledger. But in other areas they can only be deployed at a considerable compromise in functionality. Off-the-shelf packages always require some modification, either to make them fit a specific business environment or to provide a unique function needed for a competitive edge. They are costly to acquire and much of the cost of ownership, such as the cost of modifications, is hidden.

■ Business models - why re-invent the wheel?

A model-based approach to development provides all the advantages of an off-the-shelf package - with none of the disadvantages, particularly if the application can be acquired as a fully specified, up-and-running model of the business requirement - an application template.

Such a model can be rapidly and easily adapted to suit the needs of a specific business and enhanced to provide functionality that gives unique features for competitive advantage. And it can be deployed in a variety of different platforms and computing styles. Because it can be re-partitioned, it is also scalable as the business grows, requiring better performance, higher transaction volumes or more user access.

Today, there are more than 12,000 developer-years invested in a huge range of application templates delivered as business models across the world. Many of these models represent complete applications, ready to be deployed in any number of environments using Composer's 100% code-generation capabilities.

Continuum

Continuum SICS, part of the Continuum software group, is focused on providing IT-based expertise to the insurance and reinsurance market. The SICS application has established an undisputed position as the market leader in Europe.

Technological advancements, especially within development tools, have initiated a major development project to totally remodel the SICS application for client/server technology. The application will be called SICS/nt.

SICS/nt, a Composer-built application, can be updated and tailored with comparative ease and in a flexible manner. This will benefit the end user, the insurer/reinsurer, in that their unique business circumstances can be addressed very rapidly.

CONTINUUM SICS

Shortening the delivery lifecycle

Traditionally, a model-based approach has been associated with a 'waterfall' lifecycle, where the entire system's requirements must be analyzed minutely, before any application can be developed and delivered to the business. 'Fast delivery' is not a phrase normally associated with this type of development process. However, a model-based approach, supported by a fully functional repository and high levels of automated system generation, offers the very best environment for Rapid Application Development (RAD).

What is RAD?

Rapid Application Development approaches have some key characteristics:

- Incremental delivery of the final system
- High levels of automation
- User involvement throughout the development process
- Development by a small empowered team making use of intensive workshops to drive requirements and translate them into working software
- Reuse of existing software before building from scratch wherever possible

RAD epitomizes the need for IT organizations to become very closely aligned with the business. It includes techniques to translate requirements directly into systems which implement business processes. It requires tools that insulate developers from underlying technology - because they will only have time to consider things that directly translate into business benefits. Additionally, RAD supports delivery of high integrity systems that are adaptable to business change.

The role of repository and automation

One of the key features of a repository is that information about the system to be delivered is stored in one place and one place only. So a small empowered team is able to add facts to the repository in any one of the views of the application's model simultaneously as they become apparent during intensive development workshops. The overall integrity of the model is maintained by the repository. This also means that applications can be delivered incrementally, with confidence that each new delivery phase will be fully compatible with previous deliverables. Automation is also important. It means that the RAD team can focus exclusively on business issues and delegate the technology concerns to Composer, which is optimized to exploit the full power of modern client/server environments. Composer's capability to perform 100% system generation directly from the business model is critical in isolating the developer from technical concerns.

Prototyping

Because the business model is directly translated into a working system, RAD teams can exploit the capability to generate working prototypes in a local workstation environment before deploying on the more complex environment required by the final system. Business users are encouraged to interact with the prototype and work to refine requirements in the business model at an early stage in the project.

"Our decision to go ahead and use the Composer-generated template was based on several factors. First, we could produce the new system cheaper and we thought quicker than the packaged alternative or even an outsourced alternative. Also, it fits in with the architecture we had adopted."

David Tomsett, Zurich Insurance

Assembling applications from components

Learning from industry

Most people with limited knowledge of the software industry are amazed when they learn that business applications are usually custom built! The concept of componentization was successfully implemented long ago in many other industries, but has eluded commercial business application software.

Users of model-based development approaches discovered some time ago that a business model is an ideal vehicle for building application systems. The idea of the business model as an 'application template' has been used to great effect, harnessing the two key factors inherent in the business model - the ability to quickly understand the business functionality through the high-level specification and the ease of customization that this approach facilitates.

Component-based development

More recently these same characteristics have evolved into the component-based development approach which provides a fundamentally improved basis for the scoping of applications. No longer is the scope of the application based on the current requirements or business budget but on the services that are required by the business.

Component-based development is the next generation of application development approaches. It embodies key principles of object orientation while minimizing the risk of a pure object oriented approach. This is accomplished by using robust modeling tools like Composer and applying the concepts of encapsulation, data abstraction, rapid prototyping, inheritance through imbedding and 'plug and play' at the desktop.

Composer from Texas Instruments Software supports component-based development. Models of encapsulated business services can be captured in the repository, and code generation facilities turn these high-level business specifications into operational software components. These components, in turn, can be deployed into client/server systems.

Avoiding islands of automation

The introduction of client/server computing and business process reengineering has resulted in system development being spread widely throughout the organization. This is advantageous, because it helps technologists to closely align with the needs of the business. This natural evolution, however, has established islands of automation - pockets of developers using a variety of different, non-integrated technologies to build tactical applications to support their own business unit's immediate needs. Component-based development avoids this by enabling development organizations to be aligned with their businesses in a controlled fashion.

A new approach to delivering information systems

Central IT organizations very often become buried under a backlog of requests to modify existing systems and demands to build new applications for business users while attempting to keep pace with a constantly changing environment.

Component-based development represents a significant evolution on traditional techniques for developing software systems. Imagine a world where business units are able to respond quickly to new challenges and rapidly changing markets, and they are empowered with the flexibility to act quickly on innovative ideas. What if they are able to work together with technology specialists in a common process to deliver the information systems needed to drive the business?

Component-based development relieves the pressure on central IT organizations, allowing them to reduce the development backlog and concentrate on provisioning an information architecture that works and tools that put that infrastructure to best use.

Once an inventory of components exists, a new kind of application development approach emerges. Component builders provide fully-tested components to satisfy more complex business needs, while others less skilled in IT may assemble applications from the available components.

Business and technology specialists working together

Central IT developers who are proficient in the modeling of business rules focus on building or buying software components for use in enterprise-wide applications. These components can then be reused in other applications to support a specific business area. Departmental developers or end users who understand the tasks required to support the business can take advantage of these components, assembling applications for their business units.

In addition, business units can take advantage of these components as they build smaller, tactical systems using their desktop productivity tools, such as Microsoft's Visual Basic or Excel. This capability is enabled by using Composer to create software components that conform to the OLE connectivity standard, which is supported by a wide range of desktop applications. The Arranger tool from Texas Instruments Software then allows business units to use OLE-compatible desktop tools to assemble applications that safely access server-based software components.

A new way of delivering packaged software

Software packages will undergo a major change over the next few years as a new market emerges around components - up-and-running business service support systems that are understandable by end users and technical specialists alike. In fact, Texas Instruments and Microsoft have formed a partnership to establish a framework for application development and design of the supporting repository.

Building good software components

■ If organizations are to benefit from assembling information systems from components, they must first learn how to build good components.

■ Is source code a good component?

Software components are usually described in source code. But can source code be used to describe good, reusable software components?

When we consider code reuse, we often think of C++ classes, which are low-level programming components. These components are detailed in a manner that is incomprehensible to the business user. These building blocks are the rivets, nuts, bolts and gearwheels of the object revolution.

But they do nothing to put the development power where it is needed most. If the business user is to be involved in the application development process, then the components of the application must be clearly recognized and understood in business terms. Business users need the whole parts, connected by these rivets, nuts and bolts.

■ Modeling components

A modeling component exists not as a piece of executable software, but as a model of the business. Modeling components represent business items and business rules. They are understandable and recognizable in business terms. Products, such as Composer, are focused on building models of the business that are a rich source of reusable components.

Though modeling components may be understandable by the business, they still need to be turned into software components and plugged together into a system before they can actually execute. Business users do not understand this process. Developing good components is the key to successful and widespread reuse. They must be understandable and usable by both developers and business people alike.

In model-based development, IT specialists get significant benefits if business models and software systems are linked together through a repository like Composer's. In the world of software components we call this link the business object.

"Texas Instruments is doing some very exciting things in the field of applications development and the whole technology landscape. Their products, such as Composer and Arranger, allow IS organizations to start to make the move into component-based development and develop applications that are not monolithic, but instead are composed of components that can be used with other existing desktop and Windows-type applications."

Dave Kelly
Hurwitz Consulting Group, Inc.

Business objects

■ Business objects are large-grained components that represent something business people deal with in the course of doing their jobs and offer a service that is understandable at a business level. They hide details of implementation, exposing only the information that is relevant. If you sit with a business user and discuss a customer, you talk about a service, such as 'check credit rating.' The user of the business object doesn't need to know that the operation is a CICS transaction executing on a remote server.

With business objects we have components that are truly useful. They are understood by the business, and because they hide the details of the underlying technology, business units can more easily build their own systems by plugging them together using a variety of techniques facilitated by Composer and Arranger, available from Texas Instruments Software.

■ Looking after the corporate data asset

Business objects take responsibility for the integrity of the corporate database, because the only way users interact with the database is by using one of the services of the business objects. Using the business object concept allows insulation of the corporate database from application assemblers. By building appropriate security into the business objects' services, control and security are retained when the component is published for widespread use.

"Components are up and running business objects that can be strung together by end users to build applications. So this level of reuse is aimed at end users rather than programmers, and for this reason alone are more likely to succeed."

Henk Bakker, OVUM

Empowering the enterprise

■ A new approach to information systems delivery is required, which empowers individual business units to take control of their own information needs. But at the same time enabling central IT to retain control of essential criteria, such as quality of solution, downstream maintenance resources, likely fan-out requirements and protection and integrity of enterprise data.

Arranger

■ Arranger, from Texas Instruments Software, offers an extended capability to model-based development. It brings remote business objects onto the PC desktop and makes their services accessible by desktop productivity tools. Using the business object concept, professional developers use Composer to generate the databases and program code. Having created and tested the software components, they are published in Arranger's catalog for reuse at the desktop.

Business units can then browse the catalog to select business objects to satisfy a need and assemble them into an application. Arranger shields the business user from the underlying technology by automatically attaching the remote information service to a familiar desktop application tool, such as Microsoft's Excel or Visual Basic using OLE automation.

■ Relieve the pressure on central IT departments

A great deal of development and delivery workload on tactical information systems will be removed from the IT department and repositioned with the business unit's own developers and end users.

■ Widespread, secure access to the corporate data asset

Because the components that will be reused in applications developed by business units have been developed by IT professionals as software components, they will be high quality and cannot in any way threaten enterprise data integrity.

"Arranger is like the super glue - I can snap in and snap out objects to it, and I'm going to give my team a new life in this world where different technology teams are advocating different solutions. Arranger allows different development communities to have a foundation where they can move their development head on with confidence that the data is valid by using a Composer server routine, guaranteeing that the business rules are being enforced when that data is displayed or updated."

Otis Garber
Blue Cross and Blue Shield of Florida

"[OSIRIS] is a very mission-critical application. The bank would just stop if it didn't work."

Pierre Pennone
Unicible

Gaining competitive advantage from information systems

■ Managing a dispersed development environment presents something of a challenge. How do you organize a business unit IT staff to take advantage of new techniques for solving their own information needs? And how can a central IT organization best support the business units, while protecting the corporation's information asset and providing an information system architecture that is flexible to support changing business needs?

■ Component warehouse

So, what types of applications should be developed this way instead of using a formal model-based approach? It is when business units have an immediate need for information at the desktop for local decision support, such as ad-hoc retrievals or reports. This could be thought of as an component warehouse. The component warehouse goes further than data warehouse, because it provides business users direct, safe read-and-write access to corporate information and business processes. The business units do not have to engineer their own access to corporate data - and can execute a decision based on local information analysis by directly updating the corporate data model.

"We believe Arranger will allow the end users access to data in a controlled way. They can then manipulate, massage, print, or report the data however they want without having to call IS for help."

Skip Kapur, Ericsson Data Services

■ Managing the development organization

The whole organization will need to evolve into a structure and culture where central developers, department developers, information workers and end users work together in a common process. The main focus for central developers will become architecture control - networks, hardware, operating systems, databases, tools and methods support. Plus the provision of enterprise-wide applications - those software components or systems that are used by multiple business units.

Technology center teams will work in an advisory capacity helping all application developers, central as well as departmental units. Central application developers and the departmental business unit developers will work closely together to ensure that the enterprise-wide systems meet the needs of the business. Finally, departmental developers will work with their business users advising them on how best to satisfy their own information needs.

■ Reengineering the information delivery process

Organizations will require help in how best to reengineer their information delivery process to take advantage of a model-based approach to application development, and, in particular, how to implement systems from software components. Texas Instruments Software is able to advise on all aspects of information system delivery for organizations looking to achieve and to maintain that elusive competitive edge. Support ranges from white papers, to hands-on training and consultancy. Areas covered include business process reengineering, technical architectures, project planning and management, model management, development coordination and full software factory implementation.

Microsoft leads the way in object interoperability standards

OLE is the industry's most widely supported object-based software integration architecture. With OLE, applications, systems and platforms from a broad range of vendors integrate seamlessly with each other and with custom and legacy software. OLE makes users and developers more productive by giving them choices of vendors, products and strategies.

Microsoft has designed OLE as a pragmatic and customer-oriented approach as part of an open design process. The result is a standard set of component interfaces, supported by Macintosh and UNIX, as well as Windows family operating systems, which allow components created in any vendor's environment to interoperate with any other. By providing OLE support, Microsoft and more than 300 other vendors will continue to ensure maximum interoperability between products, such as Visual Basic 4.0, office products, such as Excel, Word and Access, as well as those of other vendors.

Arranger is one such product, unique in its ability to link desktop applications to corporate systems, running in a wealth of server environments including UNIX and traditional mainframe environments, such as MVS

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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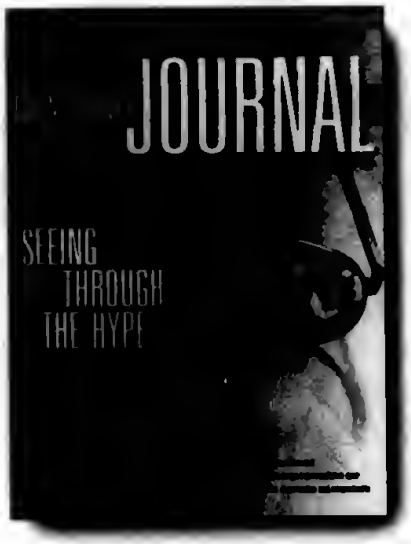
Computerworld's bimonthly magazine on distributed computing

April Issue



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Some question the trend toward more powerful chips in laptops, 49

Servers & PCs

Serving intranets

Sun, SGI bulk up their Web server packages

By Craig Stedman

World Wide Web servers aren't just for the Internet anymore.

Hooked by the lure of corporate intranets, bitter rivals Sun Microsystems, Inc. and Silicon Graphics, Inc. (SGI) recently loaded their packaged Web servers with bigger bundles of preinstalled software. The beefier platforms are meant to be turnkey servers for customers who run applications on intranets.

Packaged Web servers can ease installation and configuration burdens on customers. For example, Sun officials vow that the company's Netra machines can be up and running in less than 45 minutes. Several users who were drawn by the convenience factor said the increased bundling that Sun and SGI are offering should further automate the installation process.

"I don't want to have to pay people to do that stuff," said Chris Keenan, director at Bell Atlantic Corp.'s southern regional operations center for data network services in Silver Spring, Md. Keenan recently bought one of SGI's WebForce servers for use in an intranet that Bell Atlantic is building.

The purchase predated SGI's announcement last month of a WebForce Intranet package that includes Netscape Communications Corp.'s suite of Web server software, but Keenan said he is trying to get SGI to bump him up to the expanded version. The suite should be more robust and secure than the Netscape Communications Server that SGI offered before, he said.

Standardizing on preconfigured intranet servers also should reduce system administration headaches, said Carl Howe, director of Web services at BBN Corp., an Internet access and service provider in Cambridge, Mass.

BBN already uses Netra and WebForce systems to handle external Web serving, but for internal intranets it has bought plain Unix machines and added software on its own. But the extra goodies that Sun and SGI have now thrown in "make some sense, particularly when

Serving intranets, page 49

In the box

Sun's new Netra Internet servers have the following features

BASE SYSTEM	
Processor:	143-MHz or 167-MHz UltraSPARC
Operating system:	Solaris 2.5 optimized for Web server use
RAM:	64M bytes to 1G byte
HTTP performance:	188 to 216 hits/sec.
PREINSTALLED SOFTWARE	
Security:	Checkpoint Software's Firewall-First
Web services:	Netscape's Enterprise Server and LiveWire site management software
Authoring tools	Netscape's Navigator Gold and Sun's Java developer's kit with sample applets
Connectivity:	IPX gateway with five-user client license and Domain Name Service server
Base price:	$16,395 to $24,395

Vendors chip away at Pentium

Cyrix, AMD challenge Intel's hold on high-end processor market

By Bob Francis

Users can finally evaluate Pentium-powered PCs sans the "Intel inside" label, but the question may be, "Does anyone care?"

Both Cyrix Corp. and Advanced Micro Devices, Inc. have introduced new Pentium-class processors, which means Intel Corp. no longer has the Pentium market to itself.

For users, that may mean Intel will continue to feel some price pressure on Pentiums.

Then again, it may not.

AMD in Sunnyvale, Calif., is shipping lower-speed Pentium-class processors, comparable to Intel's 75-MHz and 90-MHz chips. A 100-MHz 5K86, as AMD classifies its chips, will be available in the third quarter. Faster processors are due out by year's end.

But with Intel declaring 100 MHz as its entry-level chip and working to push the market to the Pentium Pro, AMD's efforts will likely produce benefits only for bottom-feeding corporate PC buyers in the short term.

Cyrix in Richardson, Texas, is attacking the high end of the Pentium product line. But its promised 200-MHz Pentium-class processors won't be out until year's end.

Even though AMD and Cyrix are offering lower prices than Intel, analysts noted that Santa Clara, Calif.-based Intel has plenty of profit cushion and could drop prices quickly should it feel threatened. But those companies are unlikely to pose a big threat, given their lack of manufacturing capacity, said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz.

Cyrix has also begun to ship its own line of PCs (see chart). Cyrix's new systems seem well-designed and executed, according to Eric LaFortune, a senior computing systems professional at Unocal Corp. in Bakersfield, Calif.

"I was surprised. I thought they were more than comparable with what's out there from Intel, and the price is very good," LaFortune said. He is already a user of systems powered by Cyrix chips, and he said his group may use some of the new systems. Pricing for a Cyrix 6x86-P133 starts at $2,399. A competitively outfitted Intel-powered PC would be at least several hundred dollars more, analysts said.

Cyrix's move into the systems business is an attempt to chip away at Intel's growing motherboard and systems business.

For users, Cyrix's systems gambit offers Intel some competition to provide innovation for on-chip multimedia and graphics, said Martin Reynolds, an analyst at Dataquest, Inc. in San Jose, Calif.

Cyrix is shipping its own Pentium-class desktop PCs

6x86 PC systems

Processor:	133-MHz or 166-MHz Cyrix 6x86
RAM:	16M bytes expandable to 32M bytes
Disk drive:	1G byte to 4G bytes
Graphics:	PCI graphics and Matrox graphics card
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Boston Boston/Percy Ross

Runners *in the Boston Marathon will have tracking devices laced on to their shoes*

You've heard of information at your fingertips. Now comes information from your shoestrings.

All of the 38,000 runners at this year's centennial Boston Marathon on April 15 will wear a Champion Chip, a tiny radio-frequency chip laced on to their shoes. The chip will transmit data on runners' performance to a custom information system set up by Maynard, Mass.-based Digital Equipment Corp. for the Boston Athletic Association.

Runners will step on an electronic pad at the finish line that triggers an RF signal from the chip. The signal input will be tabulated and made available just moments later on the World Wide Web at http://www.BostonMarathon.org. *—Jaikumar Vijayan*

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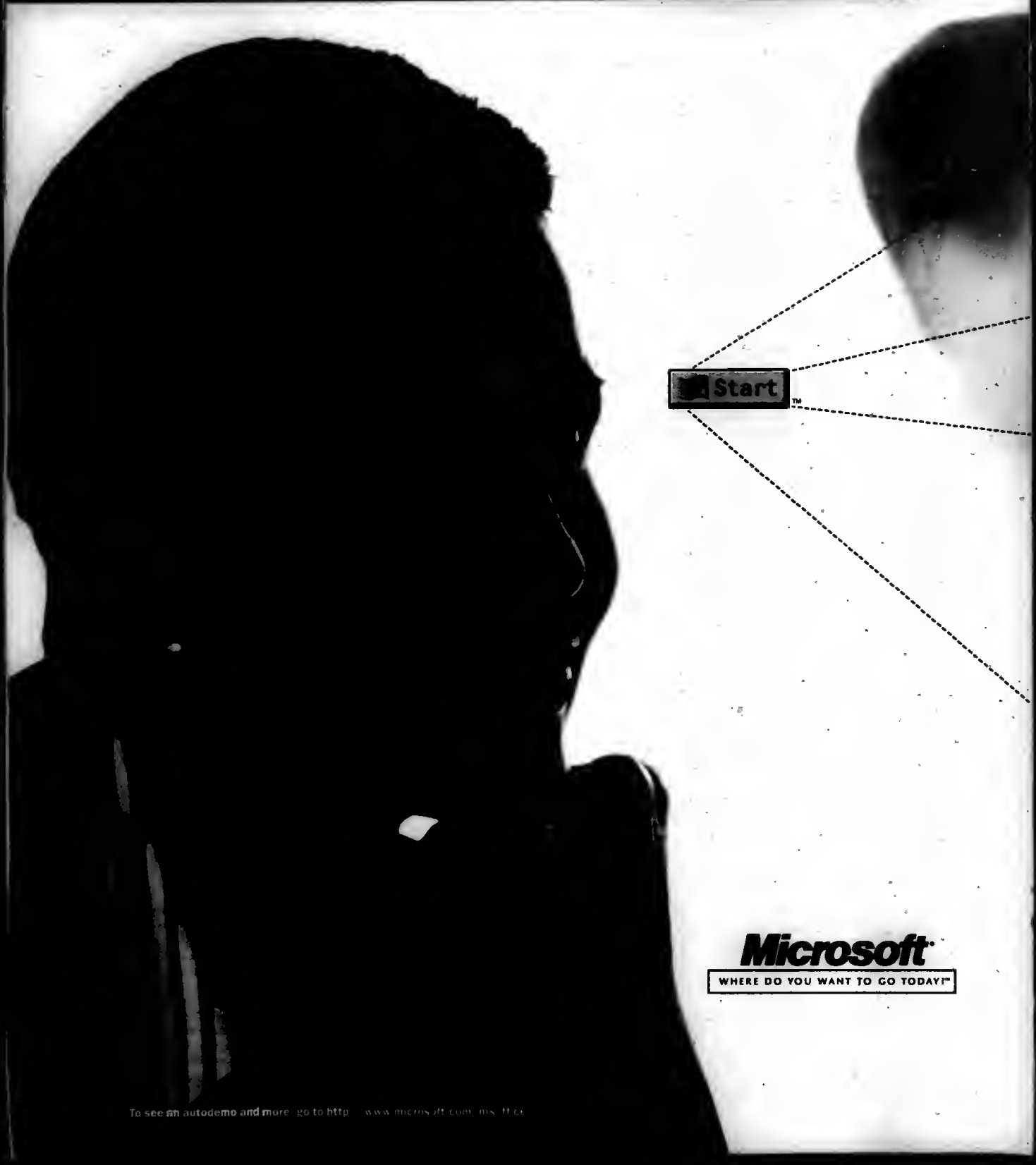

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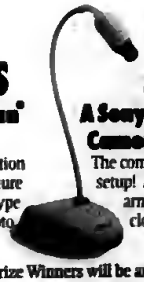

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Please pass along this issue of COMPUTERWORLD to an associate after you have finished playing the game.

This Week's TechnoTrivia Questions

Find the answers in this issue of Computerworld

1. What computer system first used dual computers in active and standby modes for reliability?
2. What early personal computer had the same name as a cola drink?
3. At the conclusion of their trade show exhibits, Hewlett Packard always plays what musical piece in their show booth?
4. How many parking spaces are there in the garage of Bill Gates' new home?
5. Boeing Aircraft recently used four Cray supercomputers in connection with what sporting event?

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Notebook prices chase chips in upward spiral

By Mindy Blodgett

Is faster better when it comes to notebooks? That's a question some users and industry analysts have begun to ask about the laptop industry's current trend toward more powerful processors.

When Intel Corp. announced its 133-MHz Pentium processor, vendors from both the top and second tiers immediately announced multimedia notebooks that support the faster chip. In recent months, Intel released 100- and 120-MHz Pentiums, which the notebook makers also quickly supported.

Some users welcomed the push toward speed and power, but others said the faster chips were unnecessary. "We need notebooks for word processing, spreadsheets — that kind of thing. And for those purposes, 90- and 100-MHz chips are all the horsepower you need," said Bruce Benham, vice president of information techology at Re/Max International, Inc., a real estate firm based in Englewood, Colo. "Only a small percentage of users need those super-fast chips."

Bruce Benham *of Re/Max International says '90- and 100-MHz chips are all the horsepower you need'*

Bill Ablondi, an analyst at Giga Information Group in Cambridge, Mass., said, "The slower Pentiums still have a lot of life left in them. Some users tell me they are perfectly happy with the 386 speeds."

But users said that as Intel releases faster chips, vendors phase out the slower processors to make way for the higher speeds.

Benham, who buys Dell Computer Corp. notebooks, said that up until a couple of weeks ago, he was able to order notebooks with 75-MHz chips. But these slower notebooks are in short supply, so the company told Benham he must move to ones with the faster chips.

"The problem is, those notebooks cost $500 or $600 more," Benham said. "If you bought a notebook just six months ago, you are made to feel that it is obsolete."

But the faster chip announcements keep coming:

- Last week, Dell in Austin, Texas, upgraded its Latitude XPI notebooks, adding 100- and 133-MHz chips. The 133-MHz model with 8M bytes of memory and an 11.3-in. screen costs $3,999, and the 100-MHz model with 8M bytes of memory and a 10.4-in. screen costs $2,999. The notebooks are available now.
- Panasonic Personal Computer Corp. in Secaucus, N.J., announced the CF-62 multimedia notebook with 100- and 133-MHz chips, a 12.1-in. active-matrix color screen and a lithium ion battery. The notebooks will ship in June. Pricing wasn't available.

The Dell Latitude XPI

Processor: 133-MHz Pentium

RAM: 8M bytes

Hard drive: 540M bytes

Screen: 11.3-in. active-matrix

Battery: Lithium ion

Serving intranets

CONTINUED FROM PAGE 45

you're running lots and lots of these servers," Howe said.

Sun and SGI, the two leading vendors of Unix-based Web servers, focused on outbound Internet uses with their first packages, which they introduced a year ago. The amount of software bundled with the packages was limited, especially in Sun's case.

But intranets — networks that make internal corporate use of the public Internet — are expected to grow much faster than external Web-based applications. Internet servers accounted for almost 60% of Web-related shipments last year, but intranet machines should grab that much of the business this year and then dwarf Internet servers going forward, according to a forecast by Zona Research, Inc. in Redwood City, Calif.

To get more in tune with the intranet, Sun late last month introduced Netra models based on its 64-bit UltraSPARC chip that double the line's performance. The first multiprocessor versions of Netra will follow this quarter, Sun officials said.

On the software side, Sun is bundling a firewall, some basic authoring tools and Netscape's Enterprise Server and LiveWire packages (see chart, page 45). Until now, Netras had no built-in authoring, and most models were equipped only with public-domain Web server software.

SGI already included authoring tools and the Netscape Communications Server with WebForce. But it also upped the bundling ante in March by adding the full Netscape SuiteSpot and tools for creating Java applications, generating intranet home pages and managing Web sites.

New Product

Communication Intelligence Corp. has announced Handwriter, a tablet, pen and software-based editing system.

The Redwood Shores, Calif.-based company said Handwriter users can enter data in spreadsheets and databases and edit word-processing documents with a cordless pen and an input tablet.

In text mode, Handwriter converts handwritten input to text by using handwriting recognition software. In ink mode, sketches, drawings and annotations are transferred directly to the screen.

Handwriter includes a 10-foot cable and can be used with or instead of a mouse. Macintosh and PC versions are available. Handwriter costs $299.

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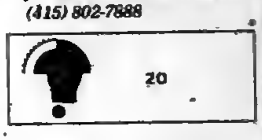

PC storage management gets better

Vendors close in on mainframe features; some holes remain

By Jaikumar Vijayan

Several vendors at Networld/Interop '96 in Las Vegas last week announced products and enhancements that once again raise the bar for PC storage management.

Some of the announcements are expected in go a long way toward easing PC storage management hassles and backup issues, analysts said.

"More and more of the mainframe class of features are making it to PC servers," said Rob Enderle, an analyst at Giga Information Group in Cambridge, Mass.

These features include better media management capabilities, an increasing amount of fail-over capabilities and better integration with system and network management products, Enderle said.

Among last week's announcements were the following:

- **Cheyenne Software, Inc.** in Burnsville, Minn., unveiled Intelligent Application Agent software that supports a wide variety of operating systems, databases and groupware. The agents provide application, database and messaging administrators with the ability to back up live applications at any time — even if the data is changing while it is being backed up.
- **Legato Systems, Inc.** in Palo Alto, Calif., unveiled its updated version of NetWorker 4.0 for Novell, Inc.'s NetWare. NetWorker 4.0 integrates a new feature called SmartMedia for creating "pools" of backup tapes. Borrowed from mainframe storage technology, pooling lets administrators back up different kinds of data from heterogeneous hardware environments onto different storage media.
- **Storage Dimensions** in Milpitas, Calif., unveiled SuperFlex 3000 with support for dynamic growth and reconfiguration for Microsoft Corp.'s Windows NT and NetWare. Among other things, the product allows for on-line storage capacity growth. For example, administrators can add a drive to a RAID array without taking the system off-line or reinitializing the array.
- **Network Integrity, Inc.** in Marlboro, Mass., unveiled LANtegrity for NetWare with WAN support. With WAN support, systems administrators can use the WAN to centralize their backup files from remote locations into a central on-line archive.

Vendors are building some of the following features into products to ease PC storage management and backup:

- Centralized backup and file restoration
- Cross-platform storage system support
- Live, on-line backup of data
- Expansion capabilities for on-line storage and RAID reconfiguration
- Closer integration with system and network management software

Products such as these significantly ease the task of systems administrators, said Julie Lahammer, a LAN systems engineer at Nordic Track, Inc. in Chaskar, Minn. The company uses Network Integrity's LANtegrity for centralized backup.

"We have three remote facilities, but we don't have IS staff in each of them. Previously, if a server went down, we had to send somebody down to the site to recover the network," Lahammer said.

Despite the progress, some holes still need to be filled, especially in terms of closer integration with system and network management products such as Computer Associates International, Inc.'s CA-Unicenter and Tivoli Systems, Inc.'s TME, said Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"There is a lot of talk about enterprise storage management capabilities. For the most part, all these products are still point-to-point solutions," Oltsik said. He said these products have limited scalability and management features.

"Everybody is talking the talk; nobody is walking the walk, yet," Oltsik said.

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Developers turn to object-oriented middleware, 54

Software

Better beta with Exchange, users agree

By Tim Ouellette

Early users of Microsoft Corp.'s Exchange got more than the usual beta software to test.

As part of Microsoft's new Early Adopter Program for the messaging and groupware software, 40 corporate user sites got more involved in the product development process than users usually do. They also received a much higher level of support from Microsoft and got a jump on the usually odious task of installing a new company-wide electronic-mail system (see chart).

Microsoft's use of a dedicated group of corporate sites helped iron out the problems with Exchange product development, and it is serving as a blueprint for future product rollouts, company officials said.

The Early Adopter Program "helped tremendously; it was way more involved than a typical beta program," said Bill Gipps, manager of technical services and customer support at Labatt Breweries of Canada in London, Ontario.

> **"It was way more involved than a typical beta program."**
>
> *— Bill Gipps, Labatt Breweries*

"Rolling out mail is a big issue, and being able to do all this work beforehand helps."

More than 200 of Labatt's 950 users now run Exchange, including one department that uses its public folders to share sensitive documents.

And Garth Keesler, a staff consultant at Intergraph Corp., had all 3,500 users at the Huntsville, Ala., company up and running on Exchange as their primary messaging system this January.

Keesler and other Early Adopter participants spent many hours at Microsoft's Exchange testing labs, working with Microsoft engineers to identify problems they had noted in their sites.

But Microsoft helped at the user sites, too.

At Federated Department Stores, Inc. in Cincinnati, Microsoft provided recommendations for which messaging gateways to install between Exchange and existing E-mail systems, how to size the Exchange server and how to organize the E-mail environment.

With Federated and other large corporate sites running beta versions of Exchange in full production, "we got great feedback and saw scenarios that we could never replicate in our labs," said Brian Murphy, an Exchange product manager at Microsoft.

In fact, Microsoft wouldn't ship Exchange until it had unanimous approval from its 40 Early Adopter companies, all of which gave Exchange the thumbs-up last month.

"We will adopt this type [of] program through other products at Microsoft. It kept us from making mistakes with Exchange," said Jim Allchin, senior vice president at Microsoft.

To get things rolling, Microsoft approached its best beta users from past trials — those who gave the most feedback and liked to get involved.

And users had a long time to put the product through its paces: Exchange was shipped two years later than Microsoft had announced. But that delay had to do with the company's internal plans for Exchange and its decision about whether to compete directly with Lotus Development Corp.'s Notes, Microsoft officials said. The beta-test program didn't contribute to the delay, the officials added.

Analysts credit the long development cycle and extensive production use of the software at the Early Adopter sites with making Exchange 1.0 more akin to a more reliable 2.0 release.

Adopt a user

Microsoft's Early Adopter Program played an important part in getting Exchange out the door

PARTICIPANTS: 40 corporate sites, including Dun & Bradstreet, Nabisco, Electronic Data Systems and Westinghouse

TOTAL SEATS: More than 40,000, excluding Microsoft's 16,000-user base

BENEFITS TO USERS:
- Support from Microsoft to help roll out Exchange into production
- Technical phone support
- On-site work at Microsoft with Microsoft engineers

Parallelism takes aim at time/space quandary

By Dan Richman

Many hands make light work, the saying goes. That's the idea behind parallelism, a trend re-emerging in data warehousing and an emphasis at the recent Database & Client/Server World trade show.

Parallelism refers to the loading, sorting, indexing and querying of data using multiple processors simultaneously.

Data warehousing

"There is a real trend toward employing multiprocessing architectures to scale up large data warehouses," said Jeff Liebl, a research analyst at Smaby Group, Inc., a consulting and research firm in Minneapolis. "Customers are demanding more sophisticated applications, like decision support and complex querying. And to do that, uniprocessor systems are clearly inadequate."

In response to user demand, mainstream vendors such as IBM in Armonk, N.Y., Hewlett-Packard Co. in Palo Alto, Calif., and NCR Corp. in Dayton, Ohio, are catching up and even overtaking the niche vendors that used to dominate parallel computing, said Howard Richmond, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

Those niche players, including Ncube in Foster City, Calif., and Maspar Computer Corp. in Sunnyvale, Calif., once led in parallel technology and sales.

And because corporate buyers feel more secure dealing with larger, older companies, such firms' involvement in parallelism is fueling its growth. The best parallel database management system implementations on the market are IBM's DB2, and Oracle and Informix databases, he said.

Time crunch

"We have so many processes running at the same time that the windows for batch processing are growing impossibly small," said Jane Hillyard, database administrator at Liberty Mutual Insurance Co. in Portsmouth, N.H. "If we don't parallelize DB2 on the mainframe, we're going to need 28 hours in a day."

One impediment to the growth of parallelism has been the complexity of programming for it. "It is a difficult task, and there isn't much out there to ease it," Richmond said.

At the show, Applied Parallel Technologies, Inc. in Cambridge, Mass., announced Orchestrate, a data-mining application that runs on IBM's RS/6000 SP (Scalable Power-Parallel) machine, under the parallel version of DB2 or Oracle Corp.'s Parallel Server. Orchestrate is expected to ship by July 1. Pricing hasn't been set.

Brief

Database Excelleration debuts remote analysis

Companies that don't want to take the time to assess the performance of their relational database management systems might consider a remote analysis from Database Excelleration Systems in Santa Clara, Calif. For $5,000, the company will log on to Unix sites that run RDBMSs from Oracle Corp., Sybase, Inc. or Informix Corp. and monitor CPU use, memory consumption and disk contention over a few days. The company statistically analyzes its observations, presents them graphically and in writing and recommends actions to eliminate bottlenecks.

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Developers turn to middleware

Object-oriented tools aid in flexibility

By Frank Hayes

If you work at one of the few large companies where all the corporate data rests comfortably in a single, spanking-new relational database, you can stop reading. You don't need object-oriented application middleware — at least not yet.

Closer Look
Application middleware

But if your company is like most large enterprises, information is scattered among different computers in a wide variety of files, databases, transaction systems and applications. This is where object-oriented middleware can help.

Application middleware handles the details of making connections among applications, data and services on a network. Particularly useful is object middleware. This lets developers create an object-oriented model of an enterprise and write applications that ask for information from the objects rather than from specific data sources or services.

"It really allows you to link anything to anything," said Pierre Pureur, vice president and risk, credit and treasury technology manager at Republic National Bank of New York. The bank uses object-oriented middleware to manage trading risk in its worldwide operations.

"You basically tell the [system] 'I really don't care how you get this information for me on the other end — this is what I want,' " said Carol Burt, technical director at BellSouth Telecommunications Corp. in Birmingham, Ala. "And it doesn't matter what kind of hardware's on the other end or what the operating system is."

Easy transition

The ability to mask the differences between computing systems has served BellSouth well since 1989, when Burt helped develop the first application middleware project for BellSouth, the Baby Bell that serves the Southeast.

The middleware also adds flexibility to move or change data sources. "It freed us up to do things like migrate over a weekend from a hierarchical database to a relational database without affecting any of the distributed systems we were building," Burt said. "Move the data from Nashville to Birmingham this weekend? Who cares, it's just a routing table entry to change."

With object-oriented middleware, users also can more easily swap in new technology for older software. That ease of change figured in General Motors Corp.'s decision to use object-oriented middleware to implement a shop-floor document-management system, said Brett Nulf, an advanced engineering specialist at Electronic Data Systems Corp.'s Client/Server Technical Services division in Troy, Mich.

The document management system wasn't designed for object middleware, but Nulf's team created a layer of code that wrapped the packaged product and gave it an object-oriented interface. To replace it with another product, developers simply write a new wrapped layer.

Stay loose

"One of the key technical requirements was that they not lock themselves in to using a specific product by a specific vendor. They wanted the flexibility to swap that out and replace it with something else if a new type of technology came down the road," Nulf said.

Another benefit is the ability to break large, complex application development projects into more manageable parts.

"Ordinarily, every developer really has to know everything about the entire system — business rules, multiple platforms, programming interfaces, stored procedures, how the data is stored," Nulf said. With middleware, work can be split into teams whose members know only their own specialty, he said.

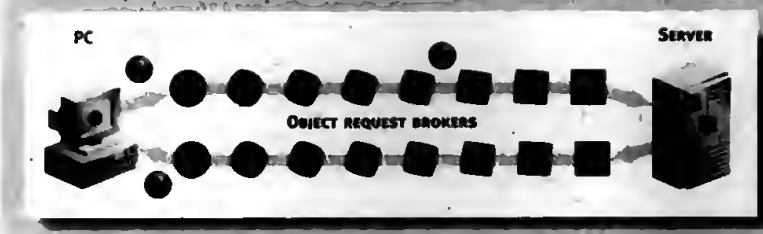
But by far the greatest advantage is object-oriented middleware's ability to connect applications across networks and platforms — and the flexibility that can bring to users.

"We are monitoring a trading desk in Sydney, Australia. We linked a trading system in Hong Kong — written in [Microsoft Corp.'s] FoxPro — in real time with our mainframe back-office system in New York," Pureur said. "It means we can give more freedom to the people in the field to be a little creative with their applications."

Object middle-what?

Information and services can reside on many types of machines on a network. Because these machines can't communicate with one another, they need object middleware to do so. Object middleware lets developers create an object-oriented model of an enterprise, and then write applications that ask for information from the objects rather than from specific data sources or services. An object request broker coordinates communication among networked objects.

The following is how object middleware works:



- An application sends a message to the object request broker, saying, for example, "I want information on this customer, and I want it in this form."
- The object request broker takes that request and figures out which server has that customer's information. It then passes the request on to the appropriate object request broker on that server.
- The first object request broker gets the response back and sends it to the application that asked for the information.

Coming attractions

With all its advantages, why isn't object middleware more popular?

The market for object middleware was about $22 million in 1994, according to International Data Corp. (IDC) in Framingham, Mass. — a tiny fraction of the billions of dollars spent on more common technologies such as databases.

One reason for the small market is that most information systems shops are focused on just getting access to data, IDC analyst Ed Ackley said. He estimated that data-access software will sell 10 times as well as object application middleware this year.

But another reason for the lack of user buy-in is that vendors are only now beginning to roll out complete sets of middleware that can be used enterprisewide.

Systems vendors, including IBM, Digital Equipment Corp. and Sun Microsystems, Inc., and independent vendors such as Iona Technologies Ltd. and PostModern Computing Technologies, Inc. are working on object middleware that spans systems ranging from mainframes to PCs. The vendors' wares also conform to the Object Management Group's Common Object Request Broker Architecture.

Meanwhile, Microsoft hopes to get its own distributed object middleware — a networked version of OLE called Distributed COM — into users' hands this year.

But the biggest impetus for object middleware may come from the Internet, according to Hugh Bishop, director of emerging technologies research at Aberdeen Group, Inc. in Boston. "A lot of companies will want to provide customers with access to their customer-service applications over the Internet, and they will have to integrate multiple heterogeneous applications quickly," he said. "I think object middleware serves a key need for that."

As a result, vendors are adding connections between their object middleware and Java, Sun's Internet development language. Sun's Joe, Iona's Orbix for Java and PostModern's BlackWidow should make it much easier to stretch the advantages of object middleware across the Internet.

— Frank Hayes

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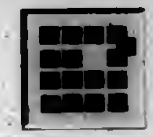

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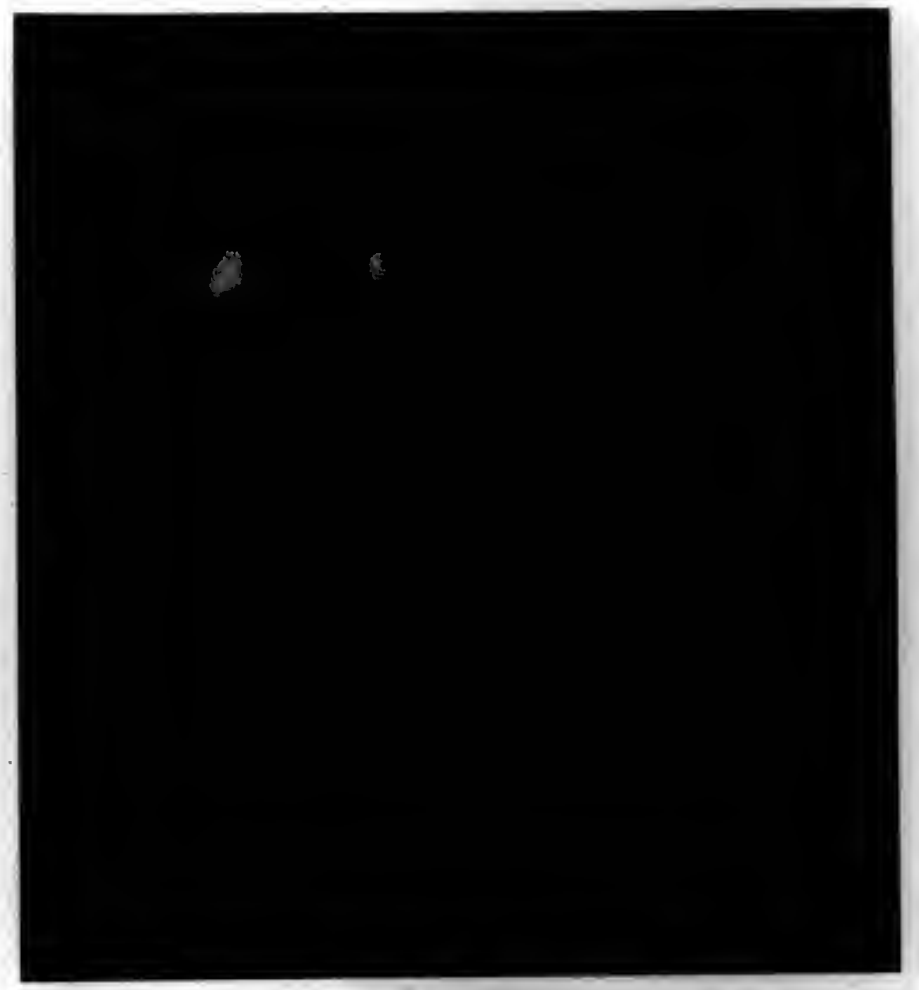

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New Products

On Technology Corp. has introduced Macro Virus Track 6.0, antivirus software.

According to the Cambridge, Mass., company, Macro Virus Track 6.0 detects and removes the five known Microsoft Corp. Word viruses as well as the most common Trojan virus, Format C:trojan. Word viruses embed themselves in doc files and spread when the document file is opened. The antivirus software scans each Word document and prompts the user to clean a file when it detects a virus.

Macro Virus Track 6.0 can scan and clean documents on a user's workstation and network drives without opening each one individually. It is compatible with other antivirus products that users may have installed to detect boot sector style viruses.

Pricing for Macro Virus Track 6.0 starts at $20 per user.

▶ *On Technology*
(617) 374-1400

Saratoga Systems, Inc. has announced SPS 3.5, a sales automation package.

According to the Campbell, Calif., company, SPS 3.5 includes a drag-and-drop schedule planner and an integrated interface to Corel Corp.'s WordPerfect 6.0.

It supports Microsoft Corp.'s Open Database Connectivity standard.

SPS 3.5 also features one-step appointment scheduling and enhanced help facilities. It includes support for a free-form text field and a look-up table function that can be used to populate fields in the SPS database.

Pricing for SPS 3.5 starts at $1,250.

▶ *Saratoga Systems*
(408) 371-9330

Precise Software Solutions, Inc. announced Inspect/SQL and Analyze/SQL, administrative packages for Oracle Corp. sites.

According to the Braintree, Mass., company, Inspect/SQL lets database administrators and application developers diagnose Oracle performance problems graphically. Analyze/SQL lets users improve systems performance by modeling SQL statements to see how they will perform without actually running them.

Pricing for Inspect/SQL starts at $5,000. Analyze/SQL prices start at $5,500.

▶ *Precise Software Solutions*
(617) 380-3300

TouchStone Software Corp. has introduced WinCheck It Diagnostic Kit, a PC diagnostic utility.

According to the Huntington Beach, Calif., company, the suite of diagnostic tools comprises PC diagnostic software, a self-booting DOS utility for hardware testing and configuration analysis, a Windows troubleshooting utility and a PC memory testing tool. The WinCheck It kit also lets users diagnose modem problems, rate multimedia performance, clean up files to free up hard disk space and uninstall unwanted applications.

WinCheck It Diagnostic Kit costs $130.

▶ *TouchStone Software*
(714) 969-7746

Communique Laboratory, Inc. has rolled out Communicate.

According to the Toronto company, Communicate is an integrated, stand-alone voice, Internet electronic-mail, fax and data software package for Windows. It includes a contact manager, a graphics editor and optical character recognition capabilities.

Communicate automatically answers incoming voice, fax and data calls and gives users a universal in-box for tracking incoming and outbound messages. Users also can retrieve voice, fax and E-mail messages from a remote location.

Communicate costs $179.

▶ *Communique Laboratory*
(905) 795-2888

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Lora O'Haver
Solutions Marketing Manager
Hewlett-Packard Company

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LOTUS NOTES.

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This explains why millions of users at the world's leading companies rely on the proven technology of Notes to stay informed and stay ahead of the competition. Instead of following it.

Lotus

Working together

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BBN PLANET

How Business Does Business
On The Internet.

The Enterprise Network

Ohio's rapid refund

NetWare streamlines tax collection

By Laura DiDio

The last thing harried citizens want to hear one week before the April 15 filing deadline is that their state's Department of Taxation has increased productivity.

But that's exactly what has happened in Ohio.

The deployment of Novell, Inc.'s NetWare 4.1 and its NetWare Directory Services (NDS) has allowed the Ohio Department of Taxation to more easily track the collection of state, local and federal taxes from its headquarters in Columbus, Ohio. It has also boosted the productivity of its 550 end users and 12 network administrators.

For instance, software upgrades, formerly a manual process that took two months to complete, are now done in an hour. And NDS requires only one administrator to maintain network operations, said Tim Martin, assistant administrator of systems integration.

Under their thumb

The Ohio Department of Taxation is responsible for collecting and tabulating 19 taxes, including personal income, property, real estate, fuel and motor oil. The agency also keeps tabs on corporate income and corporate franchise taxes collected in relation to California- and Illinois-based companies, which do especially large amounts of business in Ohio.

"Before we added the networks 18 months ago, tax collection was much more tedious and time-consuming," Martin said. "The networks make it much easier and quicker to cross-check records and compare returns from year to year."

When the department went shopping for a network, its criteria included a global database and addressing scheme to connect tax collectors in its 11 Ohio locations, Chicago and Los Angeles. The agency also wanted to centrally manage remote networks. Previously, it had only stand-alone PCs that used terminal emulation to access the mainframe hosts.

"NetWare 4.1 filled the bill on all counts," Martin said. Without NDS, Martin estimated the tax agency would need to dedicate six administrators, or one network manager for every 100 users, to manage its current crop of 15 file servers.

NDS is the global directory database within NetWare. It gives administrators a comprehensive list and view of all users and devices attached to the network. NDS also gives users a single log-in to access the network. Administrators can use NDS to troubleshoot the entire enterprise from their central management console.

"With NDS we only need one administrator to manage all 550 users," he added. That leaves others free to manage the large systems, the PCs and internetworking connectivity gear.

The department also has capitalized on the more advanced features of NDS, such as the ability to "partition" the NDS tree, creating specialized workgroups of users. This lets the administrator give groups of users the same access rights and privileges. These workers can access the same tax records and communicate with one another regardless of geographic location, Martin said.

Now, instead of having to use interoffice mail to collaborate among offices, "the networks have eliminated those worries," Martin said.

NETWORLD+INTEROP 96

Switch shilling in Vegas

By Bob Wallace
LAS VEGAS

There were more new switching products at Networld/Interop '96 here last week than there were billboards for Wayne Newton shows.

Start-ups Xylan Corp. and Agile Networks, Inc. led the pack of vendors that announced new or enhanced switching products. Xylan unveiled PizzaSwitch, a low-cost, 12-port switch, and Agile rolled out an add-on that increases the flexibility of its switches.

Announcements also came from Bay Networks, Inc., Cabletron Systems, Inc., Madge Networks, Inc., Optical Data Systems, Inc. and 3Com Corp. Switching is gaining user converts because it boosts network performance. Shared-capacity Ethernet forces all the users on a LAN to share its bandwidth, but switching uses dedicated ports to give full bandwidth to small groups of users within the LAN.

Bandwidth busting

"We're moving to SAP, and it's a real bandwidth hog," said Bill Bunch, a network specialist at Gtech Corp. in West Greenwich, Conn. "And Xylan's PizzaSwitch will provide us a nice — and low-cost — option for keeping performance up."

The $5,000 PizzaSwitch, from Xylan in Calabasas, Calif., is shipping now. In addition to its 12 switched Ethernet ports, it has two slots for a variety of high-speed data transport modules. The expansion slots for high-speed modules are a rarity for low-end boxes. Users must also buy a $2,450 software package.

The high-speed modules available include Fiber Distributed Data Interface (FDDI), Copper Distributed Data Interface (CDDI) and Asynchronous Transfer Mode (ATM). The modules range in price from $3,000 to $6,000. CDDI supports 100M bit/sec. FDDI speeds over commonly used twisted-pair wire.

Gtech plans to boost bandwidth by plugging its existing workgroup hubs, which don't support switching, in to a PizzaSwitch equipped with an FDDI module, Bunch said. That will link the switch to the firm's FDDI backbone network and improve performance among workgroups.

Agile, meanwhile, showcased a $2,500 Fast Ethernet switching module for its ATMizer Ethernet and ATM switches. The module is scheduled to ship next month.

Fast Ethernet technology supplies 100M bit/sec. of bandwidth per port. This kind of capacity will help users break up choke points in large backbone networks. Agile claims Fast Ethernet and ATM are complementary backbone network technologies, but analysts say Fast Ethernet will be more widely used.

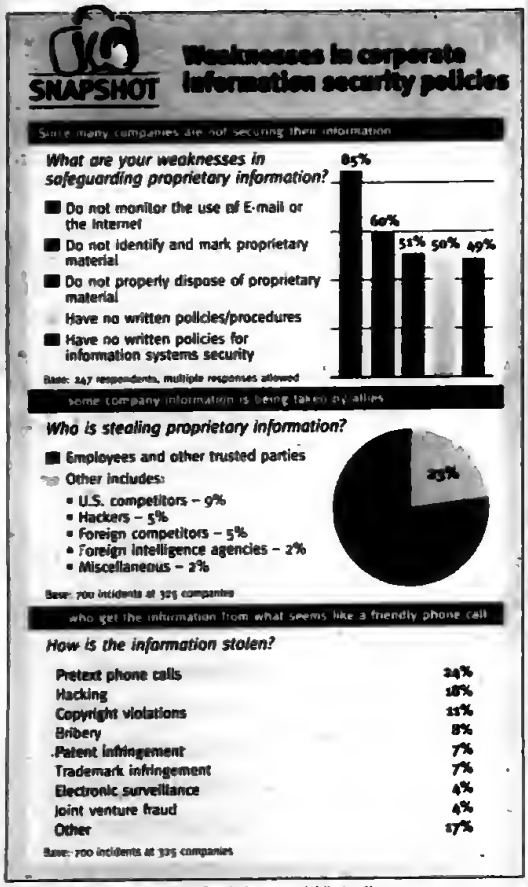
Survey says

In a survey by Infonetics Research, Inc. in San Jose, Calif., 72% of the 130 users polled said Fast Ethernet is appropriate for backbone use.

Agile's new module provides users with direct, high-speed access to an ATM backbone network.

"Fast Ethernet is climbing fast in popularity because it's a simple and familiar technology," said J'Amy Napolitan, an analyst at Infonetics Research, Inc. in San Jose, Calif.

"It's just a faster Ethernet. ATM, on the other hand, is a much more complex technology."



Source: American Society for Industrial Security International, Arlington, Va.

New Products

Micro-Integration Corp. has introduced 5250 Remote for Windows, a Windows client application for IBM AS/400 and System 34, 36 and 38 connectivity.

According to the Frostburg, Md., firm, 5250 Remote for Windows works with remote connections including those made without an internal card. The user's selection of connection type determines what modems, hardware and software drivers are required.

Pricing for 5250 Remote for Windows starts at $495.

▶ *Micro-Integration*
(301) 689-0800

Security Dynamics Technologies, Inc. has rolled out ACE/Client 2.0 for Microsoft Corp. Windows NT.

According to the Cambridge, Mass., firm, ACE/Client 2.0 lets network managers use Security Dynamics ACE/Server software and SecurID technology to protect Windows NT Remote Access Service and direct log-on to NT-based workstations and servers.

It integrates with the standard administration utilities of NT and was designed to let users deploy end-user security for an entire Windows NT-based environment.

To access Windows NT environments, users enter a personal identification number followed by the current code displayed on the SecurID token.

The product costs $149.

▶ *Security Dynamics Technologies*
(617) 547-7820

Sterling Software, Inc.'s Systems Management Division has introduced Solve: Operations for SNA, an operations management product.

According to the Reston, Va., company, Solve: Operations for SNA is a single, integrated and code-free product that lets users monitor the health of their SNA network infrastructure and automate network resources against predefined service levels. It has graphical displays that notify network operators of problem areas.

Solve: Operations features dynamically refreshed views including a resource view that displays the health of network resources; a service view that groups SNA resources into icons according to users, applications or geography; and event views that capture and respond to network exceptions.

Pricing for Solve: Operations for SNA starts at $15,000 and is based on CPU size.

▶ *Sterling Software*
(703) 264-8000

SoftArc, Inc. has unveiled FirstClass 3.5, a client/server workgroup communication system.

According to the Markham, Ontario, firm, FirstClass integrates advanced electronic mail with replicable discussion databases, remote access, forms processing, enterprise database access and on-line data services.

The latest version lets third-party developers write modules that add functionality to FirstClass. It also lets clients read and write mail and conference postings while disconnected from the FirstClass server.

FirstClass 3.5 operates in Windows, Macintosh, DOS, OS/2 and terminal emulation environments. Pricing for FirstClass server starts at $495, which includes a five-user license.

▶ *SoftArc*
(905) 415-7000

Sophos PLC has introduced Sweep for Banyan Systems, Inc. Vines.

According to the Abingdon, England, firm, Sweep for Vines provides on-line virus checking of floppy disks and Internet downloads. Sweep is run centrally on the Vines server; virus checking is transparent to users.

Sweep for Vines detects viruses by using the advanced Virus Description Language, which distributes urgent updates by fax and electronic mail.

Free evaluation copies of Sweep for Banyan Vines are available through Sophos' home page at http://www.sophos.com.

▶ *Sophos*
01 235 55-9933

Cabletron makes push into European market

To demonstrate its commitment to the European market, Cabletron Systems, Inc. plans to recruit multinational corporations and universities based in Europe to begin an extensive program of beta-testing its hardware and software products.

Cabletron plans to begin an extensive program of beta-testing in Europe.

The University of Karlsruhe is the first to be named, and final negotiations with KLM Royal Dutch Airlines are under way.

Rene Polfleyet, project manager for KLM's switching systems, confirmed that the airline is considering becoming a beta-test site for Cabletron's SmartSwitch products. However, Polfleyet refused to reveal the status of the negotiations with the networking vendor.

He added that KLM has used Cabletron equipment for more than two years and has been pleased so far.

Kingston Communications has rolled out a network based on Cabletron's MMAC Plus backbone hubs. The Ethernet system will support up to 800 users on a mixture of 486 and Pentium-based workstations and will gradually replace a Uniplex mail system running on dumb terminals.

Paul Davis, network analyst at Kingston Communications, said the firm is looking at Microsoft Corp.'s Mail to replace its Uniplex software.

Although Kingston isn't using a network management system, Davis said the company is looking at Cabletron's Spectrum on Windows NT.

—Network News (UK) staff

Briefs

Momentum rolls out file transfer package

Momentum Systems Ltd. in Moorestown, N.J., has introduced F-Mail, a package designed for secure, automated file transfers using the industry-standard TCP/IP file transfer protocol.

Attachmate rolls out connectivity software

Attachmate Corp. in Bellevue, Wash., has introduced a version of its Extra 6.1 PC-to-host connectivity software that ties Microsoft Corp.'s Windows NT and Windows 95 clients to mainframes via Novell, Inc.'s NetWare for SAA gateway. The Extra for NetWare 6.1 software has a suggested retail price of $195. The product supports NetWare Directory Services and includes World Wide Web-style bookmarking capabilities.

Tivoli adds Internet management to line

Systems management vendor Tivoli Systems, Inc. in Austin, Texas, has added Internet management to its systems management portfolio. Tivoli's Net.TME allows managers to monitor Internet applications and services. The company also is joining with SunSoft, Inc. to develop an open management standard called the Internet Management Specification for the Internet.

Bull, Banyan team up to service customers

Bull Customer Services Division plans to provide networking services to Banyan Systems EMEA (Europe, Middle East and Africa) customers. Bull will offer a hot line and on-site and remote services, drawing on Banyan's technical know-how for these services.

MCI boosts network outsourcing

Users can now get complete outsourcing for everything from wide-area networks to client/server LANs under a new program announced by MCI Communications Corp. at Networld/Interop '96. Under MCI's Enterprise Network Solutions initiative, users can get managed WAN data links from MCI and have it integrated with client/server LANs from the carrier's Ottawa-based SHL Systemhouse, Inc. outsourcer.

IBM to invest millions in global net

IBM will spend more than $10 million next year to add bandwidth to its IBM Global Network (IGN). IGN expects to update the network, offering frame-relay service by year's end and ATM service by the end of 1997.

YOU WORK ON THE WEB.
SO SHOULD YOUR E-MAIL.

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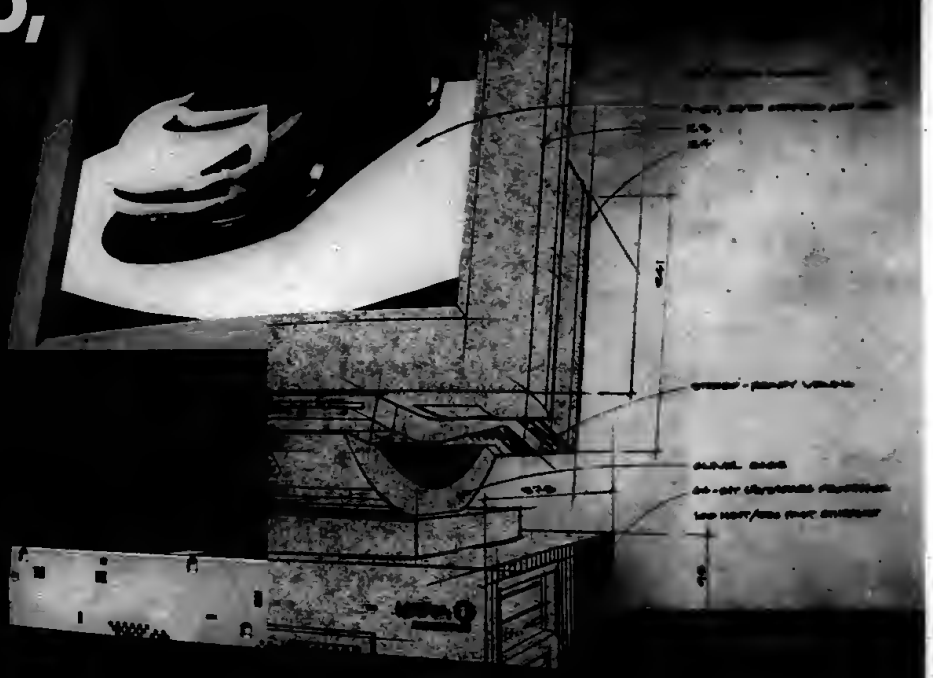
wadded
it up,



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Webmasters go pro

Web workers join Guild to vent, learn

By Kim S. Nash

Being a webmaster is a state of mind.

At least that's how The Webmasters Guild professional association sees it.

"That term — webmaster — has been thrown around quite a bit," said Matthew Cutler, founder of the 10-month-old group. "We've concluded that a webmaster isn't any one, single person."

Various roles

Webmastery is a role in information systems, marketing or sometimes other departments that can be played by a few people or even a whole team of workers, Cutler said.

Guild members include graphic artists, programmers, network administrators, marketers — a mix of professionals.

The Webmasters Guild is concerned with career and cultural issues. For example, members often discuss ways in which technical people can better relate to artistic or marketing people and vice versa, Cutler said.

Indeed, left- and right-brained thinking is key to webmastery, but it can be new territory for a lot of IS people, said Robert Holt, a webmaster at National Public Radio in Washington.

The Guild started a special interest group for intranet webmasters early this year. Ultimately, the Guild will offer job listings and webmaster certification, Cutler said.

A helping hand

Webmasters — both the technical and artistic sort — are enthusiastic about banding together to help one another at a time when their jobs are changing as fast as you can click a mouse.

"Some kind of gathering place or forum to help filter through all the new products and claims and issues would be very useful," said Gail Katagiri, a webmaster and manager of user services at Genentech Corp. in San Francisco.

Katagiri will explore joining the Guild when it comes to California this year. A San Francisco/San Jose, Calif., chapter is due to open this summer.

More than 1,000 people in 19 countries are on the group's electronic-mail subscription list (see http://www.webmaster.org for details).

Monthly meetings of 50 to 75 people are held at Cambridge, Mass.-based Net.Genesis Corp., an Internet software maker at which Cutler is director of business development, and at MIT.

The Guild also ties informal meetings to some of the bigger Internet trade shows. The group doesn't have enough money or staff yet to sponsor national events, Cutler said.

"That term — webmaster — has been thrown around quite a bit. We've concluded that a webmaster isn't any one, single person."

— Matthew Cutler, Webmasters Guild founder

The Internet, webmasters, browsers

Internet expenses

Users spend almost as much on help getting connected to the Internet as they spend on hardware and software

- Software and hardware
- Services, systems integration and outsourcing
- Total

*Projected
Source: Input, Mountain View, Calif.

Consistency counts

Webmasters must grapple with how to achieve consistency between browsers. Methods they use to solve this problem include the following:

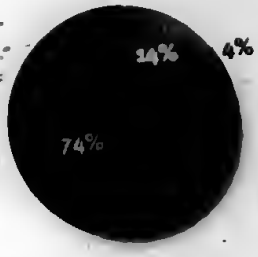
- Write their pages for Netscape 2.0 and ignore everything else
- Support multiple browsers by automatically detecting which browser is being used
- Write to the least capable graphical browser

Base: 50 webmasters and developers at consumer-oriented Web sites

Source: Forrester Research, Inc., Cambridge, Mass.

Which one?

Browsers used to visit Web sites include the following:



- Netscape Navigator
- America Online
- Microsoft Explorer
- Other

Base: 50 webmasters and developers at consumer-oriented Web sites

Source: Forrester Research, Inc., Cambridge, Mass.

NetWare clients get 'net connection

By Mitch Wagner

Quarterdeck Corp. has introduced a version of its software for connecting Novell, Inc. NetWare LANs to the Internet, with features designed to make the product easier to install and configure.

IWare InternetSuite was designed to connect NetWare clients to the Internet from a central location. Rather than configure each client for the 'net separately, systems administrators can instead run the IWare server on the NetWare LAN server and configure all the clients for the 'net at once.

The server-centric approach gives systems administrators a single point of maintenance, said Jocelyn Okrent, a product manager at Quarterdeck in Marina del Rey, Calif. IWare also gives a central point for systems administrators to control users' access to the Internet. Companies can block users from accessing proscribed sites. The software can also control access to secured intranet sites, preventing workers from accessing confidential company information.

Scott Johnston, a senior management engineer at Georgetown University and Medical Center in Washington, said the security features are very attractive.

"It adds another layer of connectivity," he said. "Your network security is as good as your weakest link, and if you centralize Internet access, that controls it. I always worry about individual users with fax modems on their machines that they use to connect on their own."

Installation gets better

In Version 2.0 of IWare InternetSuite, available immediately, the 5-month-old IWare product gets improved installation features. Previously, the software included installation routines that assumed the user was running them in a stand-alone configuration. For instance, users were asked to input the address of their mail and World Wide Web servers. Now the software comes automatically configured to point to the IWare server. Also, rather than installing the software separately on each network client from disks or a CD-ROM, information systems managers can download the InternetSuite clients from the IWare server.

The software starts at $1,195 for a license covering five concurrent users, with volume discounts available. A 100-user license, for example, is $10,995. The server runs on NetWare 3.x or higher; the client runs on Windows 3.1x or higher.

Web browsers duke it out

None is perfect, but Attachmate's Wollongong Emissary is a pleasant surprise

By Ted Vegvari

Capturing a portioo of the World Wide Web market has become a sink-or-swim proposition for many computer companies. They are battling over how to dress up our desktops with fancy images and sound and how to track our movements across the Internet.

One result is that users can choose from more than 30 browsers designed to act as interfaces to the Web. Researchers at Computer People Resources, PC Labs, in Torrance, Calif., looked closely at a few browsers' functionality, stability, Hypertext Markup Language (HTML) tag compliance, ability to consistently interpret and display Web pages, electronic-mail integration and ease of use.

In our survey, Attachmate Corp.'s Emissary 1.1 stood out for its functionality and features. Netscape Communications Corp.'s Netscape Navigator 2.0 was good at displaying HTML files, and Microsoft Corp.'s Internet Explorer 2.0 showed strong stability and Windows integration. But the real news was a major shift toward support for features unique to Netscape or Explorer, which promises a more open set of standards for the next wave of products.

It's important to oote that the browser industry is comparatively young. There are oo perfect tools. Therefore, using our grading system of "A" (very good; very stable), "B" (good; somewhat stable) and "C" (average; needs work), we awarded none of the products an "A."

The products were tested using Compaq Computer Corp. Prolinea MT 4/66 PCs with 16M bytes of memory, Microsoft's Windows 95 and U.S. Robotics Corp.'s Courier V.34 fax modems with V.32 bis compatibility. Internet service providers (ISP) used in the test were Earthlink Network and The Microsoft Network (MSN).

Review

Netscape Navigator 2.0

Netscape Communications Corp.
http://www.netscape.com

Installation was foolproof. We found that Netscape 2.0 leads the field in ease of use and serves as the model for design attributes in other browser products.

Stability was slightly problematic: We experienced the dreaded "This program has performed an illegal ..." messages but were unable to isolate the exact cause of the problem. But we noticed that the frequency of system errors increased when we ran several programs or additional sessions concurreotly with Netscape.

The browser shone in its ability to display HTML tags and was most forgiving of poor HTML editing techniques. With integrated E-mail, it's the obvious choice this week.

Strengths: 32-bit; ease of use; support for plug-ins; file transfer protocol (FTP) uploads and downloads; consistently displayed all kinds of HTML tags; worked very well on intranet and ISP dial-up services.

Weaknesses: Stability; tool bar can't be moved.

Performance: Very good, even with multiple Netscape windows open.

Grade: B

Microsoft Internet Explorer 2.0

Microsoft Corp.
http://www.microsoft.com

Installation with Windows 95 was straightforward: During the first connection, the program asked whether it should disable file and printer sharing to prevent other users from accessing our files on the local PC. This is a valuable notification feature.

After connecting via MSN, we were prompted to upgrade to the new version of Explorer. We think this is the way it should be with all applications. By controlling the wire via MSN, Microsoft can create on-the-fly vertical marketing opportunities far beyond those of traditional ISPs.

Explorer 2.0 was very stable, performance was very good, and no error messages or crashes occurred during testing. With E-mail links, Explorer 2.0 launched Qualcomm, Inc.'s Eudora Pro — pretty much the industry standard on the Internet — and oo problems were encountered with Exchange.

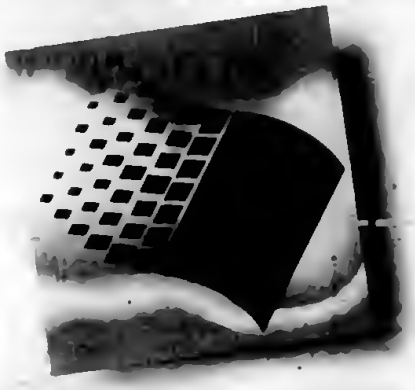
While viewing our test pages, we noticed that the Image Align HTML tag, which tells the browser how to align an image, was sometimes ignored — as it was with all browsers tested, except Netscape. Tables and graphics displayed well, and the form-fill-in fields had the richest and most "carved" — quasi-three-dimensional — look of all products tested. Menu buttons weren't easily sizable, and "Icons with text" wasn't an option on the menu.

Strengths: Tight integration with Windows; stability; fast displays; worked very well on intranet and dial-up services.

Weaknesses: Screen displays were inconsistent; correct background colors didn't appear; frames weren't displayed.

Performance: Displays were slightly faster than Netscape, and text intelligently appeared ahead of graphics.

Grade: B-



Browser line-up

	Netscape	Microsoft	Spry/CompuServe	Quarterdeck	Symantec/Delrina	Wollongong/Attachmate
Special support	Real Audio, VRML, Shockwave, Java	Real Audio, VRML	Real Audio	Real Audio	Real Audio	None
Architecture	32-bit	32-bit	16-bit	16-bit	32-bit	16-bit
Operating systems supported	Windows NT, Windows 95 Mac OS	Windows NT, Windows 95	Windows NT, Windows 95	Windows NT, Windows 95, Windows 3.1, Mac OS	Windows NT, Windows 95	Windows 95, Windows 3.1
Hardware platforms supported	Intel, Apple, Alpha	Intel, Alpha, Mips, Power PC	Intel	Intel, Apple	Intel	Intel
Concurrent screens viewing different URLs	Yes	Yes	No	Yes	Yes	Yes
Integrated E-mail	Yes	Exchange	No	Separate application	Exchange	Yes

Wollongong Emissary 1.1
Attachmate Corp.
http://www.twg.com

Our first impression of Emissary 1.1 was one of surprise: Its screen was very well laid out, and it had the best interface, in our opinion.

Our second impression was that corporate America will love it. Very different from any other browser, Emissary 1.1 was attractive and epitomized terminal emulation in a browser; it supports VT340, 3179/3279/5250, Wyse 50/60 and Tektronix 4105/4010 sessions.

In our opinion, it was the most complete telecommunications package in this review, and it's our first choice for corporate environments.

Emissary 1.1 ran without errors, and — after bulk erasing our existing browser-associated neural pathways — we quickly saw a wide gap between this browser and the others we reviewed.

We tested 3279 terminal emulation capability, copied files to our local workstation, created basic Web pages by dragging objects on to our page and used FTP to copy the files to our Web server.

Attachmate recently acquired Emissary, and we can see what the attraction was. When we tested administrative installation to our network, printer redirection using TCP/IP and FTP server features, we had no problems.

Strengths: Excellent interface and simple HTML editing capabilities built in; integrated E-mail was easy to use; best FTP implementation; powerful file manager for FTP drag-and-drop upload and download.

Weaknesses: No support for tables; 16-bit; menus occupied a large percentage of the screen display area.

Performance: Browser performance was adequate and could be improved by a 32-bit version. But this isn't a serious issue unless you use Emissary 1.1 on a 33-MHz 486-class or slower machine while running other applications.

Grade: B+

Delrina/Symantec Cyberjack 7.0
Symantec Corp.
http://www.cyberjack.com

Installation of Cyberjack 7.0 was uncomplicated and trouble-free.

Delrina, which was recently acquired by Symantec, has taken the "whole browser" approach in releasing this suite of Internet utilities; Cyberjack 7.0 is marketed as one of many applications in the suite.

Cyberjack 7.0 has an excellent FTP utility with surprisingly fast performance. The browser ran without error.

Delrina definitely has a knack for design; when a uniform resource locator (URL) didn't respond, the option to "ping" the server, or see if it exists, was displayed. The screen was very customizable and featured floating menus.

It was with these menus that we discovered we preferred moving the tool bar to the bottom. Corporate support staff will appreciate the upgrade option, which connects to the Delrina Upgrade Server on the Internet and upgrades itself.

Strengths: Easy to use, install, and upgrade; FTP program was well-designed and fast.

Weaknesses: Some pages didn't display as designed; tables didn't center on the page.

Performance: Slightly slower than Netscape or Explorer. Created a download directory instead of prompting the user for a destination directory.

Grade: C+

Spry/CompuServe Mosaic
CompuServe, Inc.
http://www.sprynet.com

This product is packaged to quickly and easily sign up first-time and early adopters of ISP services. We advise that you back up your system before installing Mosaic.

Users with preexisting point-to-point protocol accounts and those who want to use the Windows 95 dialer must rename the winsock.dll located in the c:\spry\bin\directory to, for example, winsock.net.

Mosaic ships with Internet Office Connectivity Suite 4.1. It addresses standard terminal emulations used with legacy systems, which provides a single user interface to connect to multiple emulations.

We found that, occasionally, background textures didn't display, the Image Align command was ignored, and tables didn't center on the page.

Strengths: Single interface with multiple host emulation; easy to learn and use.

Weaknesses: 16-bit; installs winsock.dll and assumes that the user wants to sign with SpryNet. We suggest that novice users back up the system prior to installation.

Performance: Slightly slower than Netscape or Explorer.

Grade: C+

Quarterdeck Internet Suite 2.0
Quarterdeck Corp.
http://www.qdeck.com

Be sure to back up before installing Quarterdeck 2.0. Setup was straightforward and easy; Version 2.0 went so far as to advise us that a copy of winsock.dll was present and that the Quarterdeck version wasn't required.

But after installation completed rebooting the PC, system fonts were changed, which affected the readability of some menus.

Although the product is 16-bit, it displayed Web pages faster than any of the other products tested.

Quarterdeck continues to distinguish its products by performance and utility. The browser cleverly supports HTML extensions that are unique to either Netscape or Microsoft.

The screen looks a bit like that of Emissary 1.1. It sports an HTML viewer area on the right side and directory and tree information on the left side.

URLs can be easily dragged in to the hot-list folder. The suite includes some excellent features, among them a history option (in the archive window) and the ability to view multiple URLs within the same window.

Strengths: Tool bar can be dragged; menus may be customized.

Weaknesses: Tables used black lines instead of the richer, more carved look; sometimes the Image Align Tags were ignored; required use of winsock.dll, but installation was designed to avoid winsock.dll conflicts; installation would be better if it didn't affect Windows 95 system configuration. While using this browser, we found only one type of error, and it was related to winsock.dll.

Performance: The fastest screen displays among the products tested.

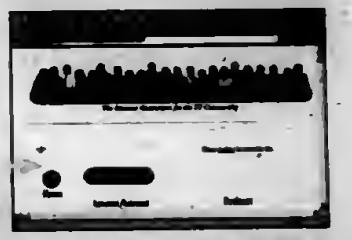
Grade: C+

Vegvari is a principal at Computer People Resources, PC Labs, a testing and development firm in Torrance, Calif. He can be reached at tedv@pclab.com.

Browsers face off

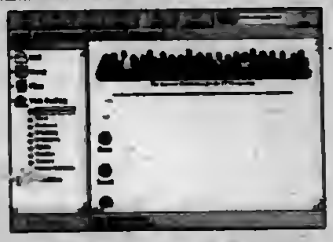
Users compare browsers based on how they fare in tests on characteristics such as functionality and stability

Netscape Navigator



Spry/CompuServe Mosaic

Quarterdeck Internet Suite Version 2.0



Attachmate's Wollongong Emissary 1.1

Delrina/Symantec Cyberjack 7.0

Microsoft's Internet Explorer

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UNISYS

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Corporate Strategies

'net may rev up auto aftermarket

By Thomas Hoffman

The year was 1974. Billie Jean King beat Bobby Riggs in the Battle of the Sexes tennis match.

An oil crisis led to odd/even license plate identification for gas rationing.

People magazine debuted, and actress Mia Farrow was on its first cover.

And six automotive parts manufacturers banded together to embark on what was then a radical concept: the creation of an industrywide electronic system for ordering parts.

Transnet user *Jim Bonham says the order-entry service is more secure than the 'net*

Pinching pennies

Twenty-two years later, the MISG/Transnet system is revving faster than ever. It established a record last year by processing 103 million lines of purchase orders for 230 manufacturers and 3,000 distributors in the $160 billion market for used car-replacement parts. Transnet members refused to say how many dollars the 103 million lines represented.

Transnet has helped industry participants dramatically slash their order-entry costs.

For example, Gates Rubber Co. in Denver would have had to pay nine additional data-entry clerks $75,000 total to type in the 6 million line items it sold through Transnet last year, according to Jim Bonham, electronic commerce manager at Gates, the world's largest maker of belts and hoses.

Management Information Systems Group, Inc. (MISG) in Research Triangle Park, N.C., is a division of the Motor and Equipment Manufacturers Association (MEMA). It oversees Transnet's client and technical services.

Transnet runs on the global access network of General Electric Co.'s General Electric Information Services (GEIS).

By using dial-up connections, distributors connect to the GEIS-based service and request parts from manufacturers.

Manufacturers download the electronic requests, place the orders and send confirmations back to the distributors.

Transnet manufacturers pay about 4 to 5 cents for each line item that traverses the GEIS network, said Allan Evans, director of marketing at MISG. Distributors don't pay for the Transnet service, which is funded by member manufacturers.

The Internet would likely be cheaper for manufacturers that have global distribution requirements, said Al Jones, general manager of the management information systems group at MEMA. Jones said MEMA plans to create a World Wide Web site beginning next year that Transnet members can use to disseminate product

Transnet, *page 72*

Acronyms

MEMA	The Motor and Equipment Manufacturers Association, a group of automobile parts manufacturers based in Research Triangle Park, N.C.
MISG	Management Information Systems Group, Inc., a division of MEMA in Research Triangle Park, N.C., which oversees technical services.
Transnet	An electronic commerce network managed by MISG on behalf of MEMA.
GEIS	General Electric Information Services, whose global access network actually runs Transnet. Manufacturers and distributors use leased-line and dial-up connections to GEIS to route orders.

MPowered to communicate

When a Marsh & McLennan employee wants to message a client, the message goes through a mail hub in Minnesota and is translated into a format the recipient can read

Outsourcing

Insurer goes outside to integrate E-mail systems

By Tim Ouellette

The number of different E-mail systems at Marsh & McLennan, Inc.'s worldwide offices kept growing while E-mail performance dropped off, so the London-based insurance broker decided to get a grip on its global network.

To avoid having to mandate a single electronic-mail system for its 10,000 employees around the world, Marsh & McLennan handed over E-mail integration to Control Data Systems, Inc. (CDS).

At the same time, Marsh & McLennan created MPower, an internal company network based on the X.500 directory standard. MPower will let office and mobile users send messages, broadcast announcements and better link customers with the firm.

Marsh & McLennan is handling the support and management components, but the company chose to outsource the E-mail integration portion of MPower to CDS.

This allowed Marsh & McLennan to integrate its E-mail systems at a fraction of the cost of building a complete system from scratch, according to Howard Green, managing director at the company.

The $400 billion international insurance broker, which acts as an intermediary between customers and insurance companies, had grown rapidly through acquisitions in recent years. But with the purchases came new business units that run nine different E-mail systems; the systems had their own formats and data types that couldn't communicate well with one another.

"The main problem was that we weren't all connected to a single directory. It was difficult to send a message from one end of the company to another," Green said.

> "The main problem was that we weren't all connected to a single directory. It was difficult to send a message from one end of the company to another."
>
> *–Howard Green, managing director, Marsh & McLennan*

And because the PCs Marsh & McLennan installed companywide wouldn't let employees adequately communicate with one another, company officials felt they were getting little or no return on their information systems investments. CDS stepped in with its Mail Hub servers, which let different E-mail systems talk to one another. CDS maintains at its Arden Hills, Minn., headquarters a Mail Hub server linked to Marsh & McLennan's network.

The Mail Hub server acts as a messaging gateway to other employees and the outside world, which ensures that a message will be seen in its original form when it is received.

Better integration

Since the service began, employees can message one another and have round-the-clock access to critical databases that run on Notes.

They can access these databases and send messages from any of the company's 170 offices worldwide. Productivity is up, and costs are down because employees don't have to resort to more expensive forms of communications such as faxing and constant telephone calls.

"Anything going to a client externally goes through the Mail Hub out to the client," Green said. With the addition of an X.400 gateway, "we believe that is a secure method of communicating with our clients."

Green said the next step is to offer clients access to the MPower network, with certain restrictions so that users don't access Marsh & McLennan's proprietary data.

Transnet

CONTINUED FROM PAGE 71

information. But some members are concerned about the impact of an Internet-based version of Transnet on distributors, who don't pay anything to use the service and who may not be set up to use the Internet.

MISG in February created Aftermarket On-Line, a Web home page (http://www.aftmkt.com) that contains news releases, membership directories and other information for automotive aftermarket players.

Some Transnet members, such as AlliedSignal Corp.'s automotive aftermarket, have formed task forces to examine the viability of Internet-based commerce. AlliedSignal is concerned about security and the availability of internal staff resources, said Karen Quebec, manager of customer service systems development at the Rumford, R.I.-based AlliedSignal unit.

Bonham and other Transnet members are leery about transacting business over the 'net. "I have a real concern about sending business data over the Internet; there's no guarantee it's going to get where it's supposed to," Bonham said. He said his organization has never lost an order over Transnet.

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Briefs

On the right course

SHL KEE Systems, a division of Ottawa-based SHL Systemhouse, Inc., recently announced CourseMaker, a CD-ROM-based package that will let corporate computer technology trainers cut and paste pieces of SHL KEE courseware to customize their own courses.

Home health services

Simione Central, Inc. in Atlanta, a consultant to hospital-based home health companies, has chosen **Integrated Systems Solutions Corp.** to provide data network services and data center management under a 10-year pact.

The missing link

Prudential Securities, Inc. recently signed a three-year, $2.5 million contract with **CrossComm Corp.** for networking products and services. The goal of the agreement is to link Prudential's 250 to 300 branch offices to its headquarters in New York. Frame-relay network installation and Integrated Services Digital Network dial-in backup capabilities will be carried out now through June.

Storage firm outsources

Public Storage, Inc., a self-storage company in Glendale, Calif., has outsourced its mainframe computer operations to **Affiliated Computer Services, Inc.** (ACS) in Dallas. Under the three-year agreement, ACS will install and operate a cluster of three midrange machines to support operations at Public Storage's 1,100 miniwarehouses nationwide. Financial terms of the agreement weren't disclosed.

Brazil bank goes client/server

Banco Bamerindus do Brasil, Brasil's third-largest private financial institution, has contracted with **Hewlett-Packard Co.** to build a $40 million client/server infrastructure that will be able to support more than 3,000 of the bank's branches.

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IDC INSIGHT

SPECIAL ADVERTISING SUPPLEMENT

AN INDUSTRY UPDATE WRITTEN BY INTERNATIONAL DATA CORPORATION AND SPONSORED BY NOVELL, INC.

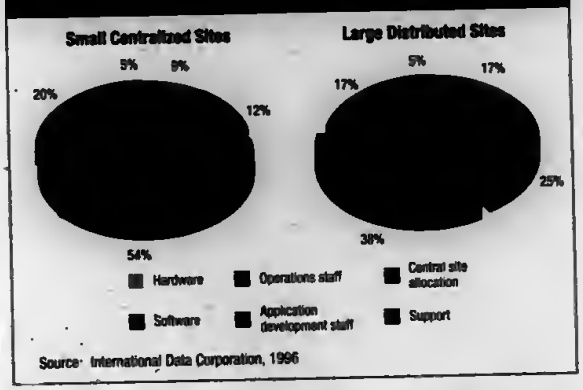
Meeting the Challenge of Client-Server Computing

Maximizing Return-on-Investment of Network Computing

The migration to client-server computing is affecting organizations both large and small almost everywhere on the planet. Computer users today have extensive access to global network-based resources, including communication gateways to other companies, individuals, and markets worldwide. Signs of this connectedness abound:

- Last year the number of LAN users worldwide hit nearly 100 million, double the number in 1993. By 1999 the number will double again
- In the same year the number of people in the world with electronic mail boxes topped 40 million. By 1999 the number will be over 125 million
- Groupware users numbered over 30 million worldwide by the end of 1995; by 1999 they will number over 250 million

Figure 1 — The Hidden Costs of Client-Server



Source: International Data Corporation, 1996

So we are heading for a wired workplace, a wired marketplace, even a wired society. However, there is a price to be paid for all this connectivity. The nearly universal implementation of client-server systems requires living with new levels of complexity and new hardware and software that people must be trained to use. Moreover, highly skilled personnel must be hired to install, manage, maintain, and administer these far-flung networks. The result is that staffing costs have become the largest contributor to total networked computing costs, regardless of the size of the installation (see Figure 1).

Until now, companies have justified the costs and complexities of client-server computing by competitive advantage–it is a very flexible and adaptable computing style. But when client-server is the norm, where will the competitive advantage lie?

IDC believes that companies that learn to manage their networked resources through technology and training will win out over their peers in the long run. Companies that understand the true costs and true benefits of client-server computing will generate quicker return for their investments. Companies that relentlessly optimize, integrate, and upgrade existing systems will stretch IT resources further and be able to reinvest sooner than competitors taking a wait-and-see approach.

Areas of Opportunity

IDC and Novell have teamed to produce this White Paper in order to help IT managers develop a strategy for maximizing return on investment in networked computing resources. It is the executive overview of three studies researched and written by IDC and sponsored by Novell. In the research it conducted,

Driving Down Networking Costs

GroupWise:

Typical annual return-per-user of 334%

Nearly $400,000 a year saved in phone costs at Farmland Foods

Courier costs cut $16,000 a year at Sheppard, Mullin, Richter & Hampton

NetWare 4:

On average 15% less expensive than NT Server from Microsoft

50% increase in users supported by a single server

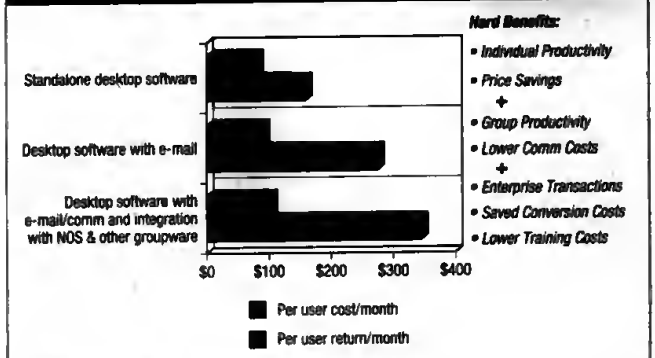
ManageWise:

$95,784 savings in business efficiency per 100 users

50% reduction in network downtime

19.7 day payback

Figure 2 — The Investment Leverage from Groupware



Source: International Data Corporation, 1996

IDC found three areas of networked computing that are focal points for ROI leverage:

1. The choice and use of communication applications such as e-mail and groupware
2. The choice and use of next-generation network operating systems
3. The use of advanced network and system management tools

In addition, IDC found that when products in support of all three of these areas work together in an integrated fashion—such as Novell's GroupWise, NetWare 4.1, and ManageWise products—benefits are compounded. Support and training costs are lower, conversions and upgrades occur faster, applications come on stream sooner, and downtime is reduced.

Applications for the Next Wave

The migration to client-server computing is a quest to provide users with access to information and computer resources beyond their desks. One of the key tools for this is groupware software, epitomized by Novell's GroupWise, software which integrates e-mail with scheduling, calendaring, and other workgroup oriented functions. The market for groupware is exploding as organizations find they can use it—specifically the e-mail function—as a platform for providing workgroup and even enterprise-wide access to information and resources.

In the research IDC conducted, almost half of the business benefits organizations received from migrating to groupware came from better internal and external communications. For instance, Farmland Foods, a $2 billion dollar meat processing company, found that since installing GroupWise, documents once faxed in 15 minutes now take less than five to e-mail. Further, the use of GroupWise saved almost $400,000 in voice phone calls a year.

Figure 2 illustrates how electronic communication and collaboration generate cascading benefits. Standalone desktop software can impact individual productivity, but when combined with e-mail, that software can improve the productivity of a whole workgroup, not just the individual user. If the e mail is specifically designed to work with the desktop software and with the network software, as say Novell's GroupWise is with NetWare 4.1, then those workgroup benefits are compounded.

This efficiency pays real dividends. When Sheppard, Mullin, Richter & Hampton, a Los Angeles law firm, made the move to GroupWise it found the support ratio for lawyers dropped from one assistant for every two lawyers to one for every three. GroupWise scheduling cut countless hours in tasks as routine as setting up meetings; GroupWise e-mail cut courier costs by $16,000 a year.

For most companies, an investment in groupware is considered an incremental cost. The hardware is already in place, as is the network. Moreover, the support costs—which account for more than 50% of the cost of operating a networked PC—are shared across dozens of applications.

But even with all the hardware, network, and support costs amortized across the groupware software, it's a bargain. IDC's research with Novell's GroupWise customers found that a typical installation required only about $250 in fully-loaded first-year costs—less than 5% of the annual cost of operating and supporting an end-user personal computer.

For that $250 investment, those same GroupWise customers found that their first-year return was over $800 on lowered communication and clerical costs alone. Meanwhile, they accrued an array of other concrete benefits, such as fewer meetings (and thus less travel and meeting administration), easier document handling, and so on. For every single GroupWise customer interviewed by IDC, return-on-investment exceeded expectations.

Modernizing the Network

If the LAN is the heart of client-server computing, then the network operating system is its soul. As LANs have evolved from peripheral information systems to the primary components of mission-critical systems, they have become more robust and more scalable. Along the way they have also provided IS personnel with the tools to manage network resources as never before.

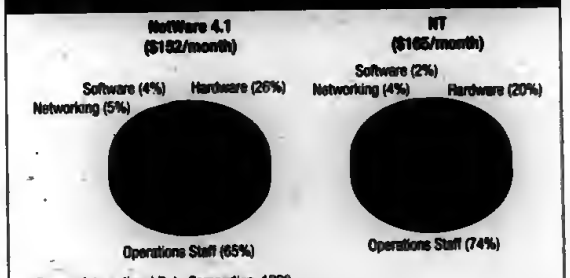
In fact, powerful new management capabilities are why many people are migrating to NetWare 4.1. With more than 375,000

licenses installed worldwide as of 1995, it is the most popular network operating system. Three key reasons for its popularity are:

- Greater functionality
- Improved management
- Directory services

Figure 3 illustrates how survey respondents believe migrating to NetWare 4.1 has enhanced network productivity—with ease of administration at the top of the list, mentioned by nearly 40% of respondents. NetWare 4.1's greater functionality has promoted companies' reliance on LANs and delivered on the ultimate promise of client-server—increased productivity.

Figure 4 — Network Cost-to-Use at Medium (300 Users) Sites (Costs After Migrating from NetWare 3.X)

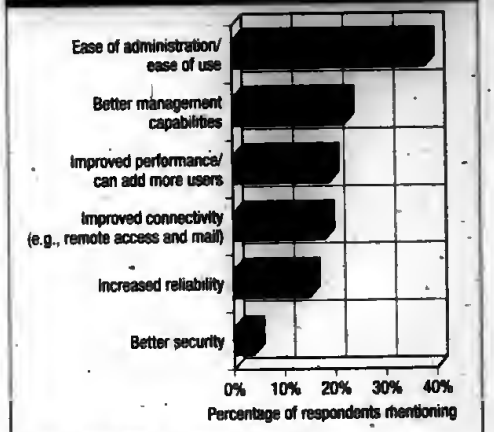


Source: International Data Corporation, 1996

According to recent surveys conducted by IDC, LAN managers report remarkable improvements in managing their networks under NetWare 4.1. Although they expected the number of nodes on their networks to grow by 260% in the 12 months following installation, they anticipated the number of file servers on the network would grow by only 163%. In other words, under NetWare 4.1, they expect to increase the ratio of users per server from 41 to 60—an improvement of 50%.

In addition to increasing the number of users per server, NetWare 4.1 provides a single point of administration with Novell Directory Services (NDS) that results in a lower cost of network administration. Figure 4 shows how, in medium-sized sites, NetWare 4.1 generates 14% lower network administration costs than Microsoft NT, primarily by increasing the user to support staff ratio.

Figure 3 — How NetWare 4.1 Improves Network Productivity



Source: International Data Corporation, 1996

Novell and other networking companies have set their sights on developing new technologies that will make tomorrow's networks more efficient and flexible. Novell has developed a Smart Global Network strategy, which entails making the network available to anyone—anytime, anywhere. An essential component of the Smart Global Network is Novell Directory Services (NDS), which enables companies to keep track of and connect all of a network's users, workgroups, hardware and software on one common access and administrative framework. NDS provides directory services technology that can handle the management of countless resources on heterogeneous systems spread around the globe. Also fundamental to Novell's vision of the future is an open set of application programming interfaces (APIs) that will make it easy to incorporate NDS and other NetWare 4 networking services into distributed applications.

Providing End-to-End Network Management

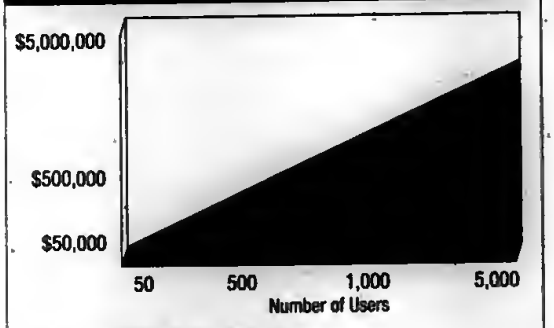
Staffing costs and end-user productivity are the issues that keep IS managers awake at night. And that has never been more true than it is today. As networks expand and intertwine, the critical success factors for network managers will include:

- Increasing network uptime, both in operation and when installing new users or applications
- Increasing efficiency by supporting rapid network growth without commensurate growth in staff
- Increasing responsiveness, fixing problems in a way that minimizes idle time for users or within business processes

To meet these needs, Novell offers ManageWise. It combines both network management and PC administration into a single, integrated package. Previously, most PC administration and LAN management products worked independently of one another, each requiring dedicated staff and resources.

ManageWise is the integrated solution that offers a single view of the network. It provides analysis tools for understanding bottlenecks; permits the configuration, inventory, and diagnostics of PCs from a single local or remote site; and provides tools for monitoring and managing remote and local servers. IDC's research demonstrates that even small and medium-sized companies can achieve significant cost savings by implementing ManageWise (see Figure 5). Network managers found that the most significant gains in efficiency were realized in server operation and help desk functions. Using ManageWise also increased LAN manager responsiveness. Before implementation, only 30% of network or end-user problems could be solved from a central site; afterwards, that number rose to 60%. This is especially important for companies with highly decentralized operations.

Figure 5 — Average Annual Savings From ManageWise



Source: International Data Corporation, 1996

Since the software-licensing, maintenance, and training costs of a product like ManageWise are low compared to the number of users potentially affected, the return on investment can be surprisingly high. Across the survey base polled by IDC, ManageWise paid for itself on average within 19.7 days.

For every 100 users, implementing integrated management with ManageWise saved $95,784 annually. These savings are attributable to the following:

- More efficient systems management, including an increase of 33% in the number of servers and 25% in the number of PCs a staff person can support, and a decrease in travel of 53%, leading to annual cost savings of $14,500
- Significant reductions in the time required to perform key management tasks—such as five hours in moves and changes, nine hours in server maintenance and configuration, seven hours in help desk and support, four hours in problem tracking, three hours in printer maintenance, etc.—saving $30,844 annually
- Dramatic reductions in network downtime (over 50%) due to network outages, delays addressing problems at the desktop, or time spent installing and configuring applications, generating annual savings of $50,440

Cost-Savings and Client-Server: They Aren't Mutually Exclusive

Believe it or not, return on investment in networking can be quantified. While it may sometimes seem that networks are growing out of control, vendors like Novell are in fact working diligently to develop products for simplified, easily managed local, wide-area, and global networks. Because of the strategic and financial advantages of networking wherever systems reside and users roam, organizations will be forced to expand the reach and complexity of their networks simply to remain competitive.

Astute companies will concentrate on migrating to client-server computing in ways that maximize both the resources available to run networks and the effectiveness of those who ultimately generate revenues and profits—namely, end users.

Call to Action

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How to succeed
at IS spin-offs
without really crying, 77

Managing

Tell me a strategy

MARY CRONIN *studies electronic commerce for a living. Her* **INTERNET STRATEGY HANDBOOK** *could bring your Web strategies to life.*

By Joseph Maglitta

"There is no single, foolproof strategy for gaining competitive advantage on the Internet," writes Mary J. Cronin in *The Internet Strategy Handbook* (Harvard Business School Press, $29.95).

Thus, the 320-page work edited by Cronin — a management professor at Boston College and prolific author on business Internet use — doesn't try a cookbook approach. Most of the 10 chapters are devoted to "candid" case studies and advice from leaders of pioneering electronic commerce and intranet projects at Dow Jones & Co., Millipore Corp., Schlumberger Ltd. and others.

Their accounts don't suggest a surefire formula but rather a portfolio of strategies: Lockheed Martin Corp. uses the Internet to integrate World Wide Web browsers, server software and custom information management tools for internal users; Digital Equipment Corp. demonstrates its Alpha systems to remote customers; Genentech, Inc. uses the 'net for global collaboration among scientists and researchers. Chapters about training, policy and productivity and a must-read checklist about measuring the Internet's business value round out the book.

Wary information systems managers will find comfort in an important common thread: What works on the wild, new frontier isn't too different from good IS practice in re-engineering and other areas. Business partnerships and alignment are key.

The compilation is the latest in a string of books that, almost overnight, has made Cronin a leading author on electronic commerce: *Doing Business on the Internet* (1994), *Doing More Business on the Internet* (1995) and *Global Advantage on the Internet* (1996). A book series on electronic commerce in several industries is under way. Off campus, Cronin heads Inner Circle Technologies, Inc., a consultancy in Newton,

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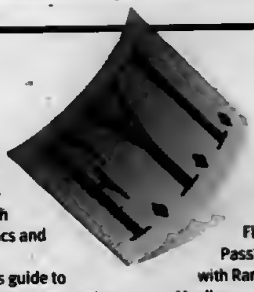
For God and company



At office birthday parties and other functions, Paul Flanagan has a special job: cake cutter and server.

"If you want to be a great leader, you must be the servant of all," explains Flanagan, vice president of information services at the Christian Broadcasting Network (CBN) in Virginia Beach, Va., and a Roman Catholic. "That's Matthew 20: 25-28."

Except for the occasional prayer that a new system will work, IS shops aren't often seen as places affected by religion or spirituality. Yet a closer look reveals IS managers in religious and secular organizations who say their faith drives their business ethics and management style.

"The Bible is the user's guide to life," Flanagan says. He held high-level positions at AT&T Corp. and U.S. Steel Corp. and ran his own software company before he took over CBN's 250-person IS shop in 1981. "All the good rules of business are there," he says.

For example, Flanagan says he might help a vendor by placing an order two months earlier than planned so the vendor can make its sales targets. "We believe in the law of reciprocity," Flanagan says. As the Easter and Passover seasons approached, and with Ramadan still fresh in the minds of Muslims, we asked some prominent IS leaders to reflect on how their faith shapes their daily work as managers.

Bill Anderson, *chief information officer, Prudential Securities, New York*

Spirituality can help IS managers make honest and more realistic decisions, says Anderson, a 40-year industry veteran and Episcopal lay leader.

"The turnover that takes place with CIOs almost invariably is caused by systems that are promised but not delivered," he says.

"But if your ultimate concern is your relationship with the Good Lord, it makes it easier and more natural to tell the truth — especially when someone is leaning on you who can effect your employment.

"My users know that when we give them a date, it's locked. Our word is our bond," Anderson says.

F.Y.I., *page 75*

Tell me a strategy

CONTINUED FROM PAGE 73

The Internet Strategy Handbook
Mary J. Cronin
Harvard Business School Press
$29.95

Mass. *Computerworld* senior editor Joseph Maglitta recently asked Cronin to expand on some of the themes in her latest book.

CW: You advise companies to create one- to three-year Internet strategies. Given the 'net's wild nature and mind-numbing growth, is that realistic?

Cronin: Absolutely. Part of developing a strategy is coming to terms with just how quickly this technology is evolving. You can't just chase this technology. You have to really work with some framework that takes in the goals and needs of your business. And then pinpoint which part fits on the World Wide Web, which of the possible applications make the most sense and provide the most value.

CW: Let's talk about IS priorities. Which are key?

Cronin: The back-door integration into different systems — inventory or purchase order or customer support or fulfillment systems — is an important priority.

Decisions about whether to outsource — especially moving into electronic commerce — are important.

So is whether or not there is an application or a product that can be based on something such as Java.

Ideally, that's what you're finding in your planning process and ongoing strategy development. So you aren't just saying, "Java is hot." Instead, you're saying, "What can we do with new technology that is going to give us a breakthrough opportunity to relate to our customers?"

CW: How about staffing? Typically, are extra IS people needed?

Cronin: Companies in the book have largely been able to make do with existing staff. For the most part, it's really reallocation and redefinition of existing jobs. Often, if there's a solid plan, it points out paybacks and savings that can justify extra staffing.

CW: Do you think we'll see more companies outsourcing Internet integration and development?

Cronin: I think it's likely to happen. IBM, Digital, Microsoft, certainly Silicon Graphics and Netscape and smaller, newer companies such as Open Market ... are all developing products that will be both internally adaptable and maintained off-site, allowing companies to outsource.

CW: How are intranets and electronic commerce changing IS jobs?

Cronin: IS people really have to change their self-definition, from gatekeepers to facilitators. IS managers definitely have to get beyond saying "This is going to be a big headache," and "This is going to be a big security risk," to saying "What's the best access and security to certain kinds of data?" The challenge now is to provide the platforms that are going to allow data access across the company.

Another thing is that the complexity of Web applications and Web servers is just skyrocketing. If you want the latest kinds of applications, if you want to use Java or object-oriented kinds of information services, then you really need specialists to manage the design, the updating and the security.

CW: The early chapters of re-engineering are stained with the blood of CIOs who thought they could lead the charge. What role should IS take to prevent IS gore on the Internet?

Cronin: IS should have a role in articulating the vision, recruiting people and coordinating things. I don't think IS managers can be the absolute drivers, because the value of the Internet can't be boiled down to simply one or another IS application. Most of the actual development of Internet applications, Web content and Web functions has to come from other parts of the organization.

CW: In general, what kinds of things can companies do to improve their odds of using the Internet for competitive advantage?

Cronin: A willingness to see the internal and external use of the Web as equally important. There has to be an integrated approach to how people use the Internet and the Web internally and to how it's used for electronic commerce. Often ... there's no integration between the two.

That's a second predictor of success: the understanding and willingness that using the Internet might take some organizational change and cross-divisional efforts. Ideally, your team includes marketing, customer support, product development, sales and internal functions such as human resources. If a company isn't willing to put together a team, it's probably a sign that it isn't ready for this kind of planning process.

CW: And how can a company ensure it will blow it?

Cronin: One sign: Some divisions and areas that really ought to be using the Internet to do some key functions don't even have access to it. Maybe it's a sales force that doesn't have access to product information that some other group put out there. The salespeople are out there making sales calls and getting blindsided. Another example: If customer support is going to go on-line, somebody better provide the level of responsiveness that defines the standard for the company. Otherwise you end up with the equivalent of everyone trying to call Microsoft about Windows 95 in the first two weeks.

CW: In working with these pioneering companies, what surprised you most?

Cronin: This is a very forgiving stage of development. Some companies make dreadful mistakes and recover and go on to do some very, very good things — all within the space of 18 months.

Because the technology is changing so quickly and because people are still defining the impact, nothing is likely to be fatal right now. That won't be the case in two years. ■

Maglitta is *Computerworld*'s senior editor, corporate strategies.

Stevie Bates

For God and company

CONTINUED FROM PAGE 73

Bob Rubin, *vice president of information services, Elf Atochem North America, Inc., Philadelphia*

"The value set I have in my personal life rolls over to the workplace," says Rubin, who practices Judaism. "I can't separate me at work from me outside of work."

Rubin says a simple guideline keeps faith, family and job in balance.

"If I do something at work, I always ask, 'Would I feel comfortable going home and telling my wife and kids here's what I did?' If I wouldn't feel real good about sharing it, a little flag goes up," he says.

Mohammed Mossad, *senior vice president of IS and telecommunications, Prudential Securities, New York*

For Mosaad, faithfulness to Islam means, among other things, praying twice for five minutes between 12:30 and 5:30 p.m. and showing fairness to all, even vendors.

"I try to get the best deal for my firm without . . . injuring our vendors. I think in terms of 'good' and 'fair.' Then you have two winners."

Darwin John, *managing director of IS and communications, Church of Jesus Christ of Latter Day Saints, Salt Lake City*

A lifelong Mormon, John says he expresses faith through his job choice and by helping his workers multiply their talents.

"As you help people value personal growth, they [are able to] create value for themselves and [at the same time] increase the capability they bring to bear on the workplace, so the enterprise gains as well."

John, who began in IS in 1968, brings this philosophy each week to leaders in the information and communications function.

Interest in spirituality and a more "holistic" approach to IS leadership has grown, says Dick Dooley, a veteran consultant in Riverwoods, Ill. who does leadership training for the Society for Information Management in Chicago and other companies.

"Fatigue, stress and constant instability mean people are having a hard time coping today," Dooley says.

Several IS managers say faith keeps daily IS headaches in perspective.

"You're better able to weather *sturm und drang* and frustrations and bugs," Flanagan says. "Deciding between NT Server and NetWare 4.1 doesn't have anything to do with people's lives. But I'm building a cathedral, not laying a brick."

— *Joseph Maglitta*

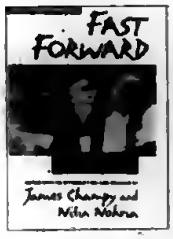
With a little thought, *family, work and spirituality can blend harmoniously, says Elf Atochem's Bob Rubin*

IS Manager's Bookshelf

The Blueprint for Business Objects
By Peter Fingar
(SIGS Books, New York; 300 pages, $39)

Fingar attempts to lay out a detailed curriculum for teaching information technology professionals about object-oriented development tools and techniques. The book is a potpourri of observations about objects, the nature of human learning and global economic trends. It also lists reference books, course titles and training vendors. Sound confusing? It is, but Fingar's book also is full of good nuggets for training or application development managers with the gumption to find them. — *Robert L. Scheier*

Fast Forward: The Best Ideas on Managing Business Change
Edited by James Champy and Nitin Nohria
(Harvard Business School Press, Boston; 320 pages, $24.95)



Hot technologies come and go, but the ability to manage change is the Energizer Bunny of the IS world — it's the issue that keeps going and going and going. The *Harvard Business Review* has published some of the most influential articles on the subject, and it's reprinted 14 of its best in this volume. This is must-read stuff for younger IS managers groping their way up the corporate food chain. It's a nice-to-have book for older executives who read these articles when they first came out. — *Allan E. Alter*

Productivity Management: Keane's Project Management Approach for Systems Development
By Donald H. Plummer
(Keane, Inc., Boston; 181 pages, $24.95)

Plummer has written a clear, easy-to-understand introduction to project management, based on Keane, Inc.'s 30-plus years experience in software projects. The book is organized around six principles, from "Define the Job in Detail" to "Agree on Acceptance Criteria." Among the most useful: Break any project, however big, into tasks that require less than 80 hours each to finish and that create a tangible product. That way, a task is done or not done: "90% done" isn't an option. — *Robert L. Scheier*

Management of the Absurd: Paradoxes in Leadership
By Richard Farson
(Simon & Schuster, New York; 172 pages, $21)

Psychologist and educator Richard Farson argues that people and organizations are inherently absurd, and you'll be a better manager if you remember that. Farson's writing ranges from insightful ("Praising People Does Not Motivate Them") to obvious ("We Think We Invent Technology, but Technology Also Invents Us") to inscrutable ("Everything We Try Works, and Nothing Works"). While *Management of the Absurd* tackles generic management issues rather than information technology management, it's an easy read, and the book can help you work through pesky people problems. If all else fails, make sure to read Chapter 33: "My Advice Is Don't Take My Advice."

— *Robert L. Scheier*

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
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31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

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Spin-off Doctors

Spin-offs are the latest fashion in corporate trauma. But breaking up the IS organization won't be so tough if you remember these suggestions from IS executives.

By Steve Alexander

Managing information systems through a successful corporate spin-off is a little bit like algebra, says Kathy Brittain White, corporate vice president and chief information officer at Baxter International, Inc.

When company A splits into parent company B and the spun-off company C, "you must remember that B plus C must be greater than A. The two new companies can't duplicate [information technology] costs, or the spin-off does not make any sense," she says.

That's one of the guidelines White is keeping in mind as she leads the IS function at Baxter, a leading U.S. producer of hospital supplies, through a corporate spin-off. Spin-offs are in vogue. AT&T Corp., Dial Corp., Kraft Foods, Inc., ITT Corp. and Hanson PLC are among the firms that recently have embraced a "divide-to-conquer" strategy. Guiding an IS function through the stresses of a corporate split is a chore that more IS managers are likely to face.

Baxter, in Deerfield, Ill., plans to split into two separate, $5 billion firms. White's charter is to move much of Baxter's 500-employee IS operations to the as-yet-unnamed spin-off. This offshoot will provide some IS services to Baxter under a chargeback system for about three years and will serve other medical industry customers. About 80% of Baxter's systems will go with the spun-off company, as will White.

She and her staff already have experience with spin-offs. Baxter has spun off two smaller health care units in recent years, and White learned a lot about dividing IS organizations when AlliedSignal, Inc., her previous employer, planned then aborted a spin-off.

Out of that collective experience, White has formulated a few simple rules for managing information technology through a successful corporate spin-off:

- Define in advance the kind of IS business relationships the parent company and new firm will have after the spin-off. If they're sharing IS, find ways to share finance and payroll systems without duplicating staffs or compromising the legal requirement to separate the two firms' accounting records.
- Maintain good relations between employees in the parent and spun-off companies, despite the stress of a corporate split-up. Former peers may become suppliers or customers through information technology outsourcing.

"Don't build fences before it's time. Include all potentially interested parties in all meetings," White says.

- Don't get so absorbed in the spin-off that you fail to pursue IS development projects already in the works. Create two IS teams, one to work on the spin-off and another to carry out development projects.

"The biggest risk is that we spend nine months just splitting up IS and don't move on into development," White says.

That same risk was on Bob Doyle's mind when he helped spin off Deerfield, Ill.-based Alliant Food Service from Kraft Foods early last year. To keep disruption of systems development to a minimum, the spin-off was put on a fast track and completed in nine months. Alliant had to replace Kraft's IS support with its own new systems for finance, taxes, treasury functions and human resources.

"When you do a spin-off, it becomes your main focus. You can't put all the resources you'd like into some of the other development efforts," says Doyle, vice president and CIO of Alliant. "But we're now back on schedule with other [information technology] developments."

Richard Koeller, director of information technology management at Nissan Motor Corp. in Gardena, Calif., has an addition to White's list of spin-off hints: Don't panic.

"There's never a time when it's more important for the CIO to act like he or she knows what's going on" than during a spin-off or sale, Koeller says. When he was an IS executive at TRW, Inc., that company disposed of six aircraft components divisions over two years.

"If [information technology] people are worried about the future and see the CIO in disarray, they'll go get another job. You have to take it upon yourself to let them know that all is well, that somebody is in charge." ■

Alexander is a freelance writer in Edina, Minn.

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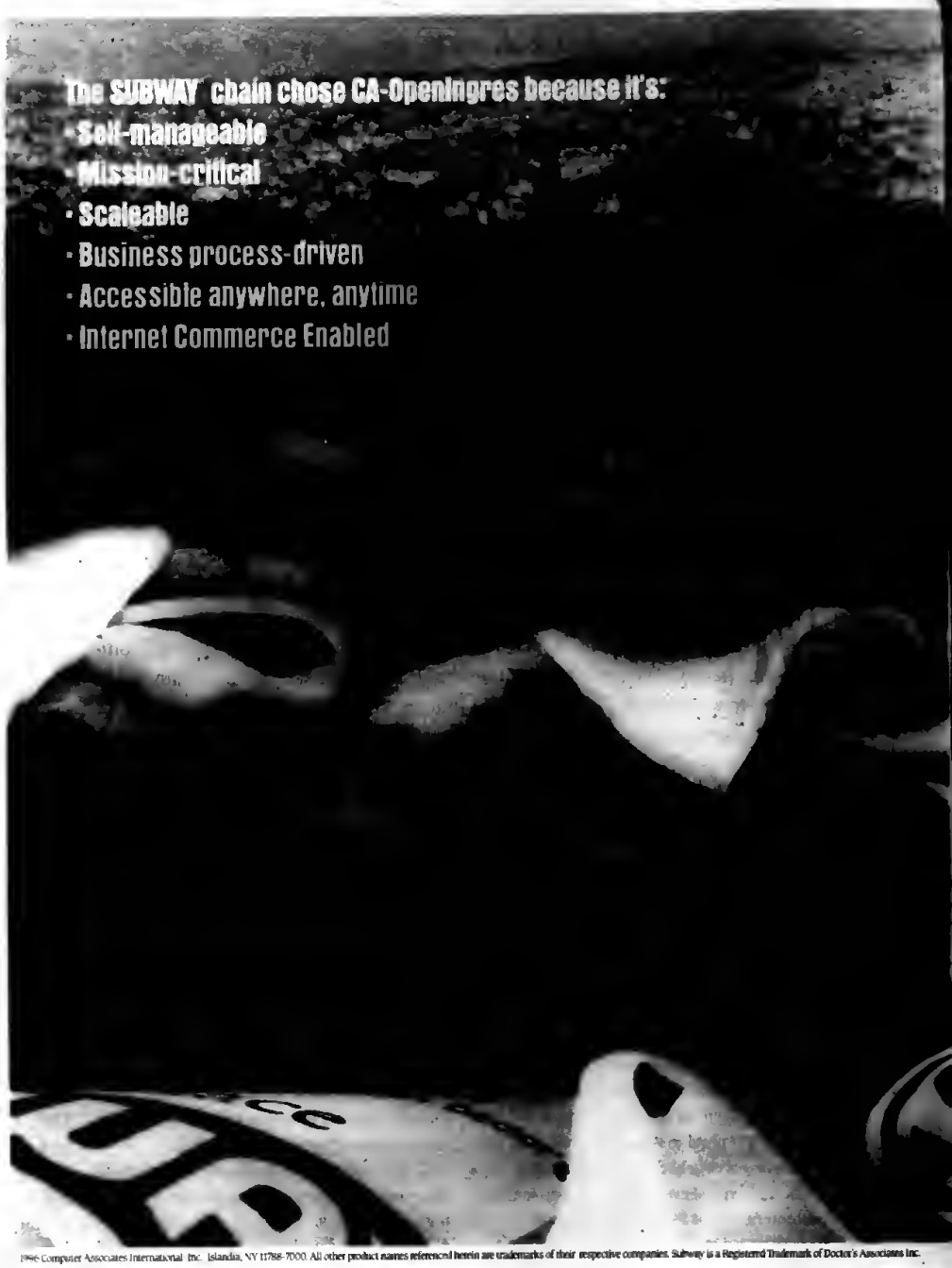

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KNOWLEDGE, KNOWLEDGE, who's got the KNOWLEDGE?

What happens to your spiffy new system when the consultants go home? That depends on how well they teach your staff. But watch out – this knowledge transfer is a lot more important to you than it is to them.

By Elisabeth Horwitt

Consultants from Booz Allen & Hamilton, Inc. were working on-site at Armstrong Worldwide, Inc. The consultants preferred to work 12-hour days Monday through Thursday, then fly home on Friday. This didn't sit well with Armstrong's information systems people who, working on their own turf with families nearby, favored a more traditional schedule.

"They were schedule-driven, trying to meet a six-month deadline," says James Sabino, director of business information services at Armstrong, a Lancaster, Pa., flooring and furniture manufacturer. "We were trying to learn how to work with a brand-new end-user computing environment."

The key word being "learn." Knowledge transfer, in which in-house IS staffers work with consultants to garner expertise and experience, was one of Armstrong's primary motivations for outsourcing IS projects. "Sending people to classes so they can do the application by themselves takes too long," says Robyn Alspach, Armstrong's IS development manager.

In a 1995 Dataquest, Inc. survey of 149 companies, 38% of respondents said they expected outsourcing to enable their companies "to gain access to strategic IT skills/expertise." In contrast, only 28.5% said outsourcing would help them "reduce costs or head count."

Knowledge transfer is crucial in a time-limited project such as Armstrong's, which some call "selective outsourcing," because the consultants must pass on enough expertise to make themselves redundant by the time they leave. Ensuring that such knowledge transfer takes place can be a challenge. The following are stories of three companys that tackled knowledge transfer during selective outsourcing.

ARMSTRONG: Managing conflict

Armstrong's IS staffers say working with consultants can be an excellent environment for knowledge transfer. But the caveat, they say, is that the process doesn't happen by itself: It requires up-front planning and ongoing management.

Booz Allen in McLean, Va., worked with Sabino's group to define and implement a Unix-based client/server platform. Conflicts between Booz Allen and Armstrong people "created a large amount of stress and some turnover for us," Alspach says. "You have to plan for the potential conflicts up front, then you have a better chance of resolving them amicably."

One likely source of conflict on any outsourcing project is IS' tendency to view the consultants as job threats, Alspach says. "They think, 'Everything could get outsourced, so why should I share with them?'" Armstrong has no such outsourcing plans, she emphasizes.

Another common source of conflict is, "Do they lead, or do you?" Alspach says. Her group wasn't happy, for example, when Armstrong's top management accepted Booz Allen's recommendation that its consultants take charge. While Booz Allen had more experience with such projects, "We prefer to have our own people leading because that way [consultants] have accountability to us," she says. In particular, she says IS workers "in the backseat of a project" have a harder time ensuring that knowledge transfer takes place. "It's not a value-added to [a consulting company]; they want to complete the project and move on," Alspach says.

Two members of Alspach's group were unhappy enough with that decision to ask management to change it. The message they got back was, "'Let's put aside our differences and all pull together,'" Alspach says.

Sabino and his counterpart at Booz Allen worked as a team to resolve project-related conflicts at a high level, Alspach says. While expressing some frustration with the team's decision, she says she recognizes the need "to have a mutual agreement about how to deal with conflict so they could present s united front" during a clash.

Generally, the managers resolved conflicts effectively, Alspach says. For example, they crafted a schedule compromise when the Booz Allen consultants wanted to work those four-day weeks.

One way Armstrong sought to avoid or minimize potential conflicts was to "spell out everything in the contract about [each party's] responsibilities, roles and deliverables," Alspach says. A crucial element of such contracts is time and budget allocations for knowledge transfer, she adds. "Otherwise, it's an extra added activity that the consultants don't necessarily know they are going to do."

"Knowledge transfer is a bit more touchy-feely."

Robyn Alspach, ARMSTRONG WORLDWIDE

However, "Knowledge transfer is a bit more touchy-feely" and therefore harder to evaluate than an actual systems implementation, Alspach says. Armstrong evaluates the transfer of expertise during outsourcing "by the success of the next [similar] project and how well we can manage and maintain" the system once the consultants have gone home, she says.

Hopefully, too, IS staffers can point to specific skills and knowledge they have gained during the collaboration. For example, "Booz Allen has a lot of experience in delivering on [end-user] expectations," Alspach says. Before the project, "we'd try to deliver 100% of what [users] wanted" and would frustrate customers by delivering everything late, she says. Booz Allen helped implement an alternative approach, "concentrating initially on delivering the 20% of a system that supplies 80% of the system's benefits to end users," she says.

Overall, the outcome of the project was satisfactory, Sabino says. By its completion, only a couple of months behind schedule, "We had become self-sufficient so in the next phase, we could take both leadership and implementation roles," he says.

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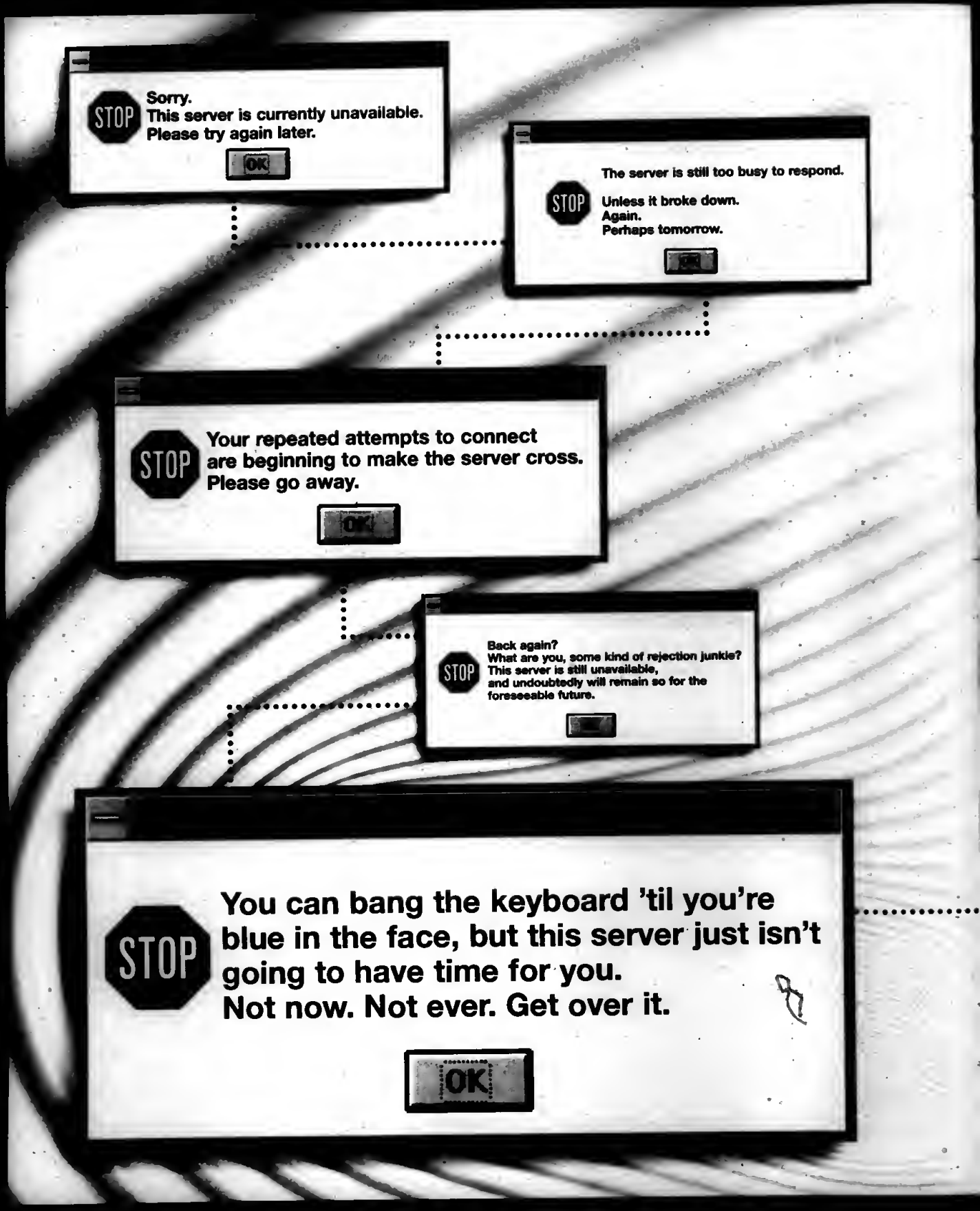
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Sorry.
This server is currently unavailable.
Please try again later.
OK
The server is still too busy to respond.
STOP
Unless it broke down.
Again.
Perhaps tomorrow.
STOP
Your repeated attempts to connect
are beginning to make the server cross.
Please go away.
OK
STOP
Back again?
What are you, some kind of rejection junkie?
This server is still unavailable,
and undoubtedly will remain so for the
foreseeable future.
STOP
You can bang the keyboard 'til you're
blue in the face, but this server just isn't
going to have time for you.
Not now. Not ever. Get over it.
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PFIZER: In search of continuity

From a systems point of view, Pfizer, Inc.'s selective outsourcing arrangement with Chicago-based Andersen Consulting was a clear success.

Andersen contributed both the expertise and the sheer number of programmers the New York pharmaceutical company needed to develop and roll out worldwide client/server financial applications, says Scott Bedrick, a project manager at Pfizer. The extra help also "allowed us to ramp up quickly," he adds. Teams of Andersen and Pfizer developers finished the applications in about 14 months, within a month or two of deadline.

But both sides agree that the knowledge transfer aspect of the project was less satisfactory. A query as to the source of the trouble resulted in a certain amount of finger-pointing between the two companies.

While Pfizer's IS people attended some classes to get grounded in the new technologies, the bulk of the knowledge transfer took place while they were collaborating with their Andersen counterparts. The consulting firm facilitated this by setting up a series of project teams, jointly led by an Andersen and a Pfizer staff member. The two sides shared responsibility on a fifty-fifty basis, says Sze-Wing Lee, who is manager of Andersen Consulting's technology competency group and Bedrick's counterpart on the Pfizer project.

This setup worked fine as a vehicle for Pfizer developers to become adept at the new environment, Bedrick says. But a more important goal was to "transfer knowledge to our production support staff to support and maintain it."

At Pfizer, systems support is handled by a separate operations staff and users in remote offices. "When a project is done in-house, you have continuity — with the people who designed and developed the system still around afterward" to transfer knowledge of the new system to the support people, Bedrick says.

In contrast, an outsourcing vendor such as Andersen comes in from the initial design stages through development and implementation "and then likes to leave," Bedrick says.

Some knowledge transfer was "done hastily or not at all."

Scott Bedrick
PFIZER

Because the consultants have no ongoing contact with support workers during the actual development, they must make extra time to do the transfer — usually at the end, which is crunch time for the project, Bedrick points out. The bottom line: Knowledge transfer to support and operations people was sometimes "done hastily or not at all," he says.

Lee has a different story to tell.

It is standard practice at Andersen to create "a development effort where the team is balanced [between software developers and] long-term support people, so we can start knowledge transfer early," Lee says. However, "When we staffed up the project, Pfizer could not find enough [Pfizer support] people to participate in the development," he adds. "Often they were dedicated resources within the Pfizer organization involved with other projects or supporting other systems."

Andersen "did ongoing transfer with people who were available," Lee says. "For those who were not, we provided documentation for post-production support."

Bedrick says Andersen provided a fair amount of documentation. But, "Sometimes it was design documents as opposed to the how-do-I-do-this cookbook type of documentation for support personnel. Besides, no matter how well you design documentation, knowledge transfer is a hard thing to do" without person-to-person communication, he says.

Andersen employees say they frequently run into problems when transferring knowledge to in-house support and maintenance people, Bedrick says. The firm also maintains that there is "no silver bullet," he adds.

The bottom line for the knowledge transfer side of the project, according to Bedrick: "It worked, but it wasn't perfect."

HILL, STEADMAN & SIMPSON: It works both ways

Hill, Steadman & Simpson's outsourcing arrangement with Links Technology Corp., a Chicago-based consulting company, was as simple as they come. Jeff Reiter, the Chicago law firm's manager of IS and chief developer, and Links partner Julie Finkelstein codeveloped an application to manage Hill, Steadman & Simpson's trademark department.

This kind of one-on-one setup can be either a godsend or sheer disaster when it comes to knowledge transfer, Reiter and Finkelstein agree. On the plus side, you don't have groups of people ganging up on one another or playing off one another's resentments. On the minus side, there's little recourse if the consultant turns out to be the wrong person for the job or if the two people simply don't get along.

"My advice to other companies looking to outsource is, make a careful choice of whom you employ," Reiter says. "Make sure they do, in fact, have the expertise you're going to pay for. Right now, the client/server development industry is immature, there is a tremendous failure rate, and there are a lot of unknowns on the market."

Reiter was lucky: He didn't have to make a blind choice. Links was recommended by Symantec Corp., the Cupertino, Calif., vendor whose Enterprise Developer was the basis for

"Make sure they do, in fact, have the expertise you're going to pay for."

Jeff Reiter
HILL, STEADMAN & SIMPSON

the new platform; Reiter also knew the consulting firm personally.

Furthermore, Finkelstein had the right technical knowledge and managerial skills for the job. "Links has a lot of experience in those types of projects," Reiter says. During her nine months on Reiter's staff, "She gave me a kind of crash course in how to take full advantage of Enterprise Developer," an object-oriented authoring tool, he adds. "She could give recommendations as to which rules should be on the client and which on the server and where custom code was needed."

The partnership also was a good fit on Reiter's side. "I had enough understanding of the technology, in general, to make the transition [to the new development environment] with someone who knew the syntax and design considerations," he says. One of his main contributions to the project was giving his collaborator "the application requirements, the database design and business rules I'd completed already," Reiter says.

Learning by doing proved more effective than a training class, Reiter says. "We both learned. Each day we saw stuff that had to do specifically with our site. A class is more about technique, syntax and methodologies as opposed to nitty-gritty, getting your hands dirty, making the product jump through hoops." Besides, "Our IS people wear a lot of hats, so they don't have the flexibility to go off-site for a two-week training class."

Hill, Steadman & Simpson "presently has no projects on the horizon that need outsourcing," Reiter says. But he says if something suitable does come up, "I'd do it again." ■

Horwitt is a freelance writer in Waban, Mass.

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Recruiters often call when you aren't seeking a new job. How you respond can determine future success.

By Jill Vitiello

When an executive recruiter calls, information systems professionals who are actively job hunting know exactly what to do. But the majority aren't in the market, and protocol may be unclear.

Many are inclined to rush recruiters off the telephone. Others simply ignore their messages. But savvy IS professionals know that even when they aren't looking to switch jobs, cultivating relationships with recruiters is one of the best ways to ensure expert help when the need arises.

"Don't say: 'I'm not looking for a job,' and hang up," advises Richard Wonder, president of Richard Wonder & Associates, Inc., an IS recruiting firm in New York.

Wonder suggests that potential candidates immediately tell recruiters they have only a few minutes. In that amount of time, a good recruiter can describe the opportunity, determine any interest and end the call.

"I listen to the recruiter describe the job — then I'm straightforward about not being interested in the position," says Ron Edelstein, chief information officer at Witco Corp. in Greenwich, Conn. "It has never hurt my relationship with recruiters to be honest."

Witco's Ronald Edelstein *says it pays to be honest with recruiters*

Wonder also recommends returning a recruiter's phone call in a timely manner. Successful IS professionals have a system for that chore.

"I'll talk to recruiters if they catch me on the phone, and I'll return the calls of those I know. But I don't call back people who don't tell me who they are or why they're calling," says Jason Browning, distinguished member of the technical staff at AT&T Bell Laboratories in Holmdel, N.J.

Browning has been with the same company for 18 years, but his highly prized skills in object-oriented programming and World Wide Web development make him a frequent target of recruiters' calls.

"I thank recruiters for calling me because they keep me posted on trends and opportunities," Browning says.

Recruiters often ask for a referral if the person they've contacted isn't interested in pursuing the job lead.

But unless you have an individual's permission to give information to a recruiter, don't do it, experts say. At the senior management and executive levels, IS recruiters don't call without an introduction.

And even though you may not need the recruiter when they call, there's no telling when you will.

"Everybody is looking for a job," Wonder says. "The only variable is when." ■

Vitiello is a freelance writer in East Brunswick, N.J.

Expecting a call

IS professionals can be prepared for a tempting offer from an executive recruiter by taking the following steps:

☞ **Keep an updated resume on file** that describes your specific technical environment and expertise. *"Companies looking to fill a job don't have time to wait for you to polish your resume,"* says recruiter Julian Gonzalez.

☞ **Join networking groups.** *"Don't limit your involvement to IT organizations – fraternal clubs, management associations and civic groups are a good source of information on the job market,"* says recruiter Richard Wonder.

☞ **Get to know the best search firms now.** *"If you establish a relationship with a recruiter who has a great track record, you can be sure that individual will bring interesting opportunities to your attention,"* says recruiter Mary Shounds.

Script for success

Try following this script for a successful dialogue, gleaned from IS pros who often find themselves in the headhunters' crosshairs:

- Offer a courteous greeting
- Set a time limit on the conversation
- Offer another time to talk if necessary
- Listen carefully to a description of the position
- Note the recruiter's name and telephone number
- Decline offers politely
- Divulge no confidential information
- Ask probing questions about salary, job requirements
- Offer to share the recruiter's name and number
- Invite the recruiter to call back in a year
- End the call on a gracious note

Power struggle

It's getting easier to snare PowerBuilder professionals. But at what price?

By Daniel Lyons

After Microsoft Corp.'s Visual Basic, Powersoft Corp.'s PowerBuilder is the most widely used client/server development tool. So it's no surprise that skilled PowerBuilder programmers are on the "most wanted" list at most information systems shops.

While it's getting a bit easier to find experienced PowerBuilder professionals, IS managers and recruiters report they still wrestle with some very sizable salaries.

• Glenn Chafe
Systems manager
Advanced technology
Canadian National Railways
Montreal

"We don't have trouble finding PowerBuilder people — we have a problem finding them at the right price. They're not cheap."

Canadian National pays an average of $60 per hour for PowerBuilder consultants. Sometimes the firm hires programmers without PowerBuilder skills and train them on the job.

"But then very quickly they realize that they can get bigger bucks, and we have a hard time keeping them."

• Stephen Maher
Resource planner
Seek Consulting Group, Inc.
Wakefield, Mass.

"There's unbelievable demand. I'd say about one-third of all the opportunities we work on these days involve PowerBuilder skills. It's very hot."

Maher recently placed a highly regarded PowerBuilder consultant at a rate of $160 per hour.

"That's really unusual, though. I'd say the average is somewhere around $50 an hour."

• Roj Snellman
Senior manager
Systems architecture group
Harris Semiconductor
Melbourne, Fla.

"Three years ago there was a very short supply of PowerBuilder people, and I was paying $120 an hour for them. The first guys who got onto PowerBuilder really had a great ride. It was a key to riches.

"Today the rate is about $40 or $50 an hour, although there are still some superstars who are worth paying $120 for.

"Now it's more mainstream. And eventually, knowledge of client/server tools will just be a requirement." ■

Lyons is a freelance writer in Ann Arbor, Mich.

Regional Scope: Northern California

San Francisco Convention & Visitors Bureau/Richard Jones

A rebounding economy and strong IS hiring market could make a move to Northern California appealing

By Linda Wilson

If you've been thinking that the culture, climate and scenery of Northern California is for you, now is the time to relocate.

Fueled by the emergence of client/server computing and the dominance of technology vendors in the region, the job market for information systems professionals in the region is hot.

And there's a lot to enjoy in the area. The weather is pleasant year-round; the region offers both mountains and the ocean; and the scenery is breathtaking.

The hiring market for IS professionals has rebounded from a recession about two years ago and will probably remain exceedingly strong for another year, according to area recruiters and IS hiring managers.

Programmers, project managers and administrators with experience in such relational database management systems as Oracle and Sybase, as well as in Windows NT and the Internet are in high demand.

Sought-after skills

Application developers with experience in C and C++ are also coveted, particularly among technology vendors. Other hot areas include LAN and WAN network administrators and engineers, help desk employees and quality assurance experts.

Northern California can be divided into three distinct regions: the San Francisco Bay Area, including Oakland, Berkeley and Marin County; Silicon Valley, stretching from Palo Alto to San Jose; and Sacramento.

The hottest IS job market is Silicon Valley. Rapidly growing technology vendors, which dominate the region, are always recruiting employees to staff their internal IS operations as well as their product development and customer service efforts.

"It's the hottest job market I have seen in nine years," says Bruce Hatz, corporate staffing manager at Hewlett-Packard Co. in Palo Alto. "All vendors are just absolutely scrambling to find the best people."

Hiring at Silicon Graphics, Inc. was very strong last year, but it's considerably slower this year. The company hired 2,200 people last year, which brought the total number of employees to 5,000. The hiring spree included 80 to 100 IS employees.

And consider the area's assets. San Jose boasts 300 sunny days a year. Recreational activities abound — there are 125 parks and two recreational lakes in San Jose, and the ocean is less than an hour away.

San Francisco offers a wide selection of fine theater, restaurants and music and is home to its own symphony orchestra and opera. There is great skiing just 3½ hours away at Lake Tahoe, and Yosemite National Park is only three hours away.

The hiring pace in San Francisco and the Bay Area, though strong, certainly isn't frantic.

The employers — many of them banks, government, retailers, utilities and health care providers — aren't growing quickly, so they don't need as many new IS employees.

A bit more low key and less expensive than the Bay Area is Sacramento. Drawn by those attributes was Intel Corp., which opened a data center there 10 years ago.

"It's a good place to work, and there are some nice recreational facilities in the area," says Zoanne Hennigan, human resources manager at Intel's information technology organization. For attractions, Lake Tahoe, the wine country and San Francisco are all about two hours away.

Sacramento offers opportunities for IS professionals with client/server skills because of the local expansion of companies with headquarters elsewhere.

"What this amounts to is that there aren't a lot of people out in the marketplace with those skills," says Karen Oberg, director of IS and office services at the California Almond Growers Exchange, a cooperative of almond farmers in Sacramento.

Oberg attributes the shortage of qualified candidates to the fact that several companies — including HP and Pacific Telesis Group — and expanded operations in Sacramento, gobbled up talent. ■

Wilson is a freelance writer in Glen Ellyn, Ill.

LARGEST EMPLOYERS

EMPLOYER	LOCATION	NUMBER OF EMPLOYEES
San Jose Metro Area (Silicon Valley)		
Hewlett-Packard	Palo Alto	16,000
County of Santa Clara	San Jose	13,512
Lockheed Martin Missiles & Space	Sunnyvale	10,124
Stanford University	Stanford	7,900
IBM	San Jose	7,500

Source: San Jose Metropolitan Chamber of Commerce, 1995

San Francisco Area (San Mateo County, San Francisco, Marin County, East Bay)		
U.S. government	San Francisco	25,041
City and county of San Francisco	San Francisco	23,824
United Air Lines	San Francisco	17,212
Kaiser Permanente Health Plan	Oakland	12,002
Bank of America	San Francisco	9,000

Source: San Francisco Business Times, 1995

Sacramento Area		
Sutter Health Care Systems	Sacramento	9,000
Raley's	W. Sacramento	4,000
U.S. Computer Services	Rancho Cordova	1,700
Teledyne	Sacramento	1,400
MTS (Tower Records, etc.)	W. Sacramento	1,200

Source: The Business Journal, Sacramento, 1995

AREA UNEMPLOYMENT

National	5.5%
San Francisco	5.2%
San Jose	4.7%
Sacramento	7.3%

Source: January 1996 unemployment figures from the Department of Labor, Bureau of Labor Statistics

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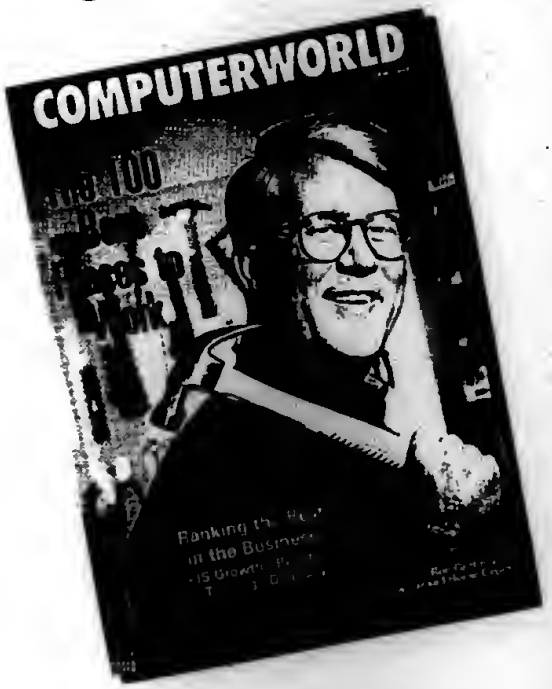

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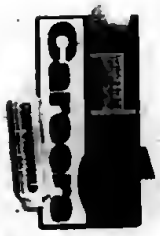

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2+ yrs. C/C++. Visual Basic and Microsoft Access. 1+ yrs. Windows MFC and UNIX. SGML and HTML exp. Macintosh. VAX. Oracle and OO methodology exp. a plus.

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2+ yrs. UNIX and NT systems admin exp. with operating system upgrade, local and remote troubleshooting, user acct. configuration, and local and remote system back-up.

If you are seeking a new challenge and have the necessary qualifications, please send or fax your resume, including salary requirements, to: **610-650-5025** or mail it to **Bell Atlantic Directory Graphics, Inc., Human Resources Dept., 2500 Monroe Blvd., Valley Forge, PA 19484.** EOE/M/F/V/H. Principals only. No phone calls, please.

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Manager Core Processing, Maitland, FL - Analyze, design, construct enhancements for financial management systems using object-oriented programming. Design coding styles, problem tracking, version and release controls. Produce data dictionary, entity diagrams, data elements and access keys. Perform database administration. Use Gupta products; SQL Windows, SQL Base, Transact SQL, Quest, ReportWindows, SQL Network. Reqs Bach in Comp Sci or Math and 2 yr exp. M-F, 8AM-5PM, 40hr/wk, $56,000/yr. Submit resume to: Job Service of Florida, 1001 Executive Center Dr., Orlando, FL 32803-3520, JO# FL-1408287

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Software Consultant - Design & develop Real Time Rating involves telecommunication to support customer cellular & billing activities, perform testing & performance tuning in an HP-UX 9000 & IMSVS86 environment with Unix & VSAM, convert applications from client mainframes to Unix system, develop new modules & batch programs for the real-time rating sub-system, hand-code migration, reports generation & testing routines; design & develop real time & batch programs using ESQL, PRO*C, Pro-Microfocus Cobol, TSORSPF, JCL, Sed, Awk & Xdb; provide technical support & ensure system compatibility with international markets. $40,000/yr 40 hrs/wk. M-F 8-5, or equivalent in Computer Sc or Computer Eng or Electronics & Communication Eng. & 2 yrs. exp. in job offered or as Systems Engineer, or Systems Analyst or Programmer Analyst. Exp. in related occupations must include use of HP-UX 9000, Unix, IMSVS86, VSAM, ESQL, TSORSPF, JCL, PRO*C, Pro-Microfocus Cobol, Sed, Awk & Xdb. Submit resume to the GA Dept. of Labor, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office. Job Order #GA8960299.

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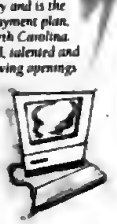

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LAN/WAN Specialists

PROGRAMMER ANALYST - Design, develop & implement software systems for industrial applications. Code, test, debug & enhance all systems using X-Windows, Open Windows, Sunview & MS-Windows. Conduct programming in C++, Pascal, Fortran (IV & 77), Visual Basic, Assembly, FTP, TCP/IP & Hummingbird. Exceed Masters in Computer Science or Electrical Engineering. Requires 2 yrs. exp as Programmer/Analyst or System/Computer Administrator which must include 1 yr exp designing & developing software systems for industrial applications using X-Windows, Open Windows, Sunview, MS-Windows, MS-DOS, VAX programming in C++, Pascal, Fortran (IV & 77), Visual Basic, Assembly, FTP, TCP/IP & Hummingbird. Exceed. 40 hrs wk 8-5. $47,000/yr. Employer paid ad. Send resume to 7310 Woodward Ave, Rm 415, Detroit MI 48202. Ref 27586

Software Engineer to provide analysis & programming services in design, development & implementation of business & quality control application using VAX/VMS, work with C, MS Windows & DEC Alpha Architecture, create realtime charting capabilities for statistical process control system, write code to generate data & conduct statistical analysis using MS-DOS UV/VIS software & SAS. Reqs. Bach. in Comp. Sci., Statistics, Comp. Engg or its equiv., 1 yr exp in job offered or 1 yr related exp such as Programmer &/or Research Assist/Programmer &/or Systems Analyst &/or Systems Programmer. Related exp must include developing, testing, programming, statistical analysis, developing specifications using SAS, MS DOS UV/VIS & HP85530 ORACLE & Visual Basic. $20.67/hr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #43898. "Employer Paid Ad"

PERSONAL COMPUTER SUPPORT SPECIALIST

A large and growing public school district in the northwest suburbs of Chicago is seeking a highly qualified candidate for a Personal Computer Support Specialist. District 15 is the second largest elementary district in the state of Illinois and operates 19 schools (15 elementary and 4 junior high). Excellent benefit package provided.

REQUIRED SKILLS

- Able to define, implement, and optimize IBM and Microsoft DOS environments on Intel platforms.
- Able to define, implement, and optimize Microsoft Windows environments on Intel platforms.
- Able to define, implement, and optimize Novell Netware IPX and ODI client drivers on Intel platforms.
- Able to diagnose and resolve hardware and software conflicts on Intel platforms running DOS, Windows, and Netware.

DESIRED SKILLS

- Novell Netware server administration skills are a plus.
- Microsoft Office configuration, installation, and optimization skills are a plus.
- IBM AS/400 PC Support configuration, installation, and optimization skills are a plus.
- Apple Macintosh System 7 configuration, installation, and optimization skills are a plus.

Salary: Not Less than $40,000

Application procedures: Interested and qualified applicants should submit a letter of application accompanied by a resume with names of at least three (3) references to:

Linda J. Vass, Ed.D., Asst. Supt. for Personnel and Human Services
Community Consolidated School District 15
580 North First Bank Drive
Palatine, Illinois 60067
Fax (847) 934-9294

An Equal Opportunity Employer

PROGRAMMER ANALYST (2 openings) (Ref 40296) - plan, develop, test & document comp programs applying knowledge of programming techniques & comp systems, evaluate user requests for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys & comp capabilities, consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Responsibilities include process flow & data flow design, technical-support & overall design of the applications, meeting with the users to gather requirements, analysis, design, development, database administration & using HPS language, IBM 3090, MVS/ESA, CICS, DB2, OS/2, REXX, COBOL, PASCAL, CA-11, CA-7, PS/2, PLATINUM tools, TSO, NDM, CLISTS & C. Req: Bach. in Comp Sci, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in ed & exp & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Systems Manager. Will accept 3 yrs of college ed plus 3 yrs exp in the job offered or in a related occup in lieu of the req'd ed & exp. Must have some related exp which included analysis, design, development, database administration & using each of the following: IBM 3090, MVS/ESA, CICS, DB2, OS/2, REXX, COBOL & PASCAL. $46,000/yr. 40 hrs/wk 8:30a - 5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit MI 48202 & include Ref# Employer Paid Ad

C++/C/UNIX

Several consultant positions in Ohio and Florida. 2+ years exp in UNIX, C++, C s/w design, devlpt and testing. Tandem/Guardian C, DSP, RF, IVR, Cellular Wireless. Top salaries, benefits & relocation. EOE

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Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs, analyze design & develop computer software for clients EDP systems, analyze, design & develop client server process for collection $ processing data process flow & data flow design, physical database modeling & layout data communication analysis & design, client server programming interfaces & technical support; create test data & specifications & user requirements, conduct feasibility studies, structured analysis & design to collect information from various modes of network tools, use Visual Basic, C Unix & Sybase. Reqs Bach in Comp Sci Electrical Electronic or Computer Engg Systems Analysis Computer Information Systems Math or equiv in ed & exp 2 yrs. exp in job offered or 2 yrs related exp such as Systems Analyst, Programmer Software Engineer or Consultant. Will accept 3 yrs. college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp designing, developing $ implementing software using C, C++ Visual Basic, Sybase SQL UNIX $ UNIX Shell Scripts. $42 940/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave. Room 415 Detroit MI 48202. Ref #41296 "Employer Paid Ad"

Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs, analyze design & develop computer software for clients EDP systems maintain & enhance insurance & financial information system (Accounts Receivable Tracking & Fecilitative Payable Systems) develop plan for programming, testing & implementation, write new programs, modify existing programs for enhancement, resolve production problems, provide technical support for maintenance of systems, generate various kinds of reports for clients & Business System Analysts. Reqs Bach in Comp Sci Electrical Electronic or Comp Engg Systems Analysis Comp Info Systems, Math or equiv in ed $ exp 2 yrs exp in job offered or 2 yrs related exp such as Systems Analyst Programmer Software Engr Consultant Account Executive of EDP Engineer. Will accept 3 yrs college ed, plus 3 yrs exp in job offered or related occup in lieu of req'd ed $ exp. Must have some related exp in analysis, programming design developing, testing, maintaining modifying implementing software system using IMS DB/DC DB2 COBOL VSAM CICS SQL UNIX $ MVS O/S $44 000/yr. 40 hrs/wk 8a-5p Send resume to 7310 Woodward Ave Room 415 Detroit MI 48202 Ref #44798 "Employer Paid Ad"

Software Engineer Designs and develops software and software systems for use in producing medical archiving and communication systems to be implemented into a graphic user interface for display on various computer systems for analysis of various medical imaging software for display on a 3D image processing system. Implements, enhances, and develops picture archiving and communication software for purposes of creating a dental cosmetic software system to display the results of ceramic and laminated dental implants and teeth whitening process to assist dental and other personnel of dental procedures. Insures integration of X-Ray camera and other hardware with developed software system. Uses C++ OOA, and OOD to design the graphical image processing in 3D medical devices. Requires Master's or completion of all coursework for Master's degree in Computer Science. Also requires one year experience in the job to be performed or one year experience as a Software Engineer. 8 experience in related field, entire experience must include use of OOA and OOD and C++ to perform 3D image processing for graphic user interface packages. Education to include completion of one course in Analytical Models and Simulation and one course in Parallel Processing. Hours 8:00 a.m. - 4:30 p.m. 40 hours per week at $40,000.00 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Narendra Kumar, Vice President, International Imaging Electronics, 881 Remington Boulevard, Bolingbrook, Illinois 60440. No Calls

PROGRAMMER ANALYST (2 openings) (Ref. 40398) - plan, develop, test $ document comp programs, applying knowledge of programming techniques & comp systems; evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys. $ comp. capabilities; consult with user to clarify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Develop $ maintain an integrated insurance information sys. design, develop test & implement using CMP/TSP/UPI, TSO/ISPF, Checkpoint/Restart, OS/2 Communication Manager, Quality Assurance testing, IBM 3090, MVS/ESA, CICS, DB2, VSAM, COBOL II, INTERTEST, FILE-AID $ EXPEDITOR. Bach. in Comp. Sci, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in ed & exp. 8 $ yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed & exp. Must have some related exp. which included using each of the following: IBM 3090, MVS/ESA, CICS, DB2, COBOL II, FILE-AID & EXPEDITOR. $50,500/yr. 40 hrs/wk. 8:30a-5p. Send resume to: 7310 Woodward Ave. Rm 415, Detroit, MI 48202 $ include Ref # Employer Paid Ad

DIRECTOR TECHNICAL SERVICES

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We have been retained by one of the world's leading Communications companies to fill the newly created position of Director of Technical Services. Responsibilities include management of Systems Programming, Performance Measurement and Data Base Administration with a total staff of over 60 individuals. Currently at 5600 MIPS and projecting growth to over 7500 MIPS, this is an opportunity to work in one of the country's largest most complex large-scale mainframe environments.

The successful candidate will have a minimum of a BS degree and 15+ years of demonstrated experience managing large staffs in support of MVS, VM and Unix operating systems in a high volume online transaction processing, client/server and mainframe environment.

Located in Maryland near Washington, D.C., our client offers competitive salaries, benefits, a bonus plan and relocation.

Please send, fax or e-mail your resume to Burt Heacock at:

Paul-Tittle Associates, Inc.
1485 Chain Bridge Road, Suite 304
McLean, VA 22101
FAX: (703) 893-3871
E-Mail: Burt@Paul-Tittle.com
WWW: http://www.careermosaic.com/cm/pta/pta1.html

Paul-Tittle Associates, Inc.

Programmer/Analyst. 40 hrs/wk. 9 am to 5 pm. $45 000 annually. Duties include: Analysis design, software development and testing of various commercial application systems on Unix base computers using Relational Database Oracle 7.0 SQL*Forms 3.0 SQL*Report Writer. Must have B S in Engineering Science or foreign equivalent or Computer Science and one year experience in job offered or as a System Engineer. Experience in job offered or as a Systems Engineer must include one year experience on Unix Oracle 7.0 SQL*Forms 3.0 and SQL*Report Writer. Must have proof of legal authority to work permanently in U S. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention JOAN SYKSTUS. Reference a V-IL 14779-S. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME & COVER LETTER

Seek programmer/analyst to develop and/or analyze functional specifications of complex programs $ produce detailed systems specification for assigned routines; develop complete test plans, assist in preparation of feasibility studies, requirement studies, systems $ programming proposals, determine optimal design method of development $ test plans for routines designed, understand & clearly define data $ programming interfaces in each assigned phase of the program or system, participate in coding $ testing assigned routines as required; assume additional responsibilities as required. Require B.S. in computer science. Require 1 yr exp. in job offered or 1 yr exp as software engineer. Experience must consist of 1 yr in C/C++, Smalltalk COBOL on DB/2, UNIX 1 yr exp. in design of inter-process/inter-machine communication layer using SNA, TCP/IP & XIPC experience may be gained concurrently. $41 400/yr. Apply at the Texas Employment Commission Dallas Texas or send resume to the Texas Employment Commission TEC Building Austin Texas 78778. J O s TX7516791. Ad paid by an equal opportunity employer

BUSINESS SYSTEM ANALYST (Ref. 40458) - Design, program, test & document company manufacturing Electronic Data Interchange (EDI) analyze both the common EDI standards (ANAG ANSI X.12) applied in automotive industry & special EDI requirement of major automobile manufacturers, design logic structure of EDI sys to ensure smooth integration with major manufacturing sys packages, develop sys functions to facilitate data communication $ data collection development on UNIX & VAX platforms using structured programming techniques. Req Master's in Industrial Management & Engineering, Manufacturing Management, Comp Sci, Systems Analysis or Comp. Information Systems, & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Systems Analyst, S/W Engineer, Programmer or Grad. Assistant. The related exp. including each of the following: Analysis design development of EDI based manufacturing systems covering operations including release/order processing, purchasing, shop floor scheduling, inventory tracking, MRP, receiving $ shipping for clients who are original equipment manufacturers & suppliers in the automotive industry, EDI data translation, data mapping & transaction reporting on the basis of ANAG ANSI X.12 EDI standards; $ using Materials Management Process (MMP) & Supplier Direct Ship (SDS). $48 000/yr. 40 hrs/wk., 8a-5p. Send resume to 7310 Woodward Ave. Rm 415, Detroit, MI 48202 & include Ref # Employer Paid Ad

Software Engineer. Part of a development team developing new application programs to reengineer internal applications and support automation needs of company's internal operations. Performs client/server application analysis, program development and testing. Performs analysis and design using Booch object oriented methodology using Rational ROSE case tool and implemented with Microsoft Visual C++ programming language and Open Database Connectivity (ODBC). Uses Neuron Data tool for writing applications that are platform portable. Develop application programs using Oracle as backend database. Performs source code version control using PVCS. Work experience in Microsoft Visual C++ and ODBC, Rational Rose case tool, Neuron Data development tool and PVCS. Object oriented methodology, Oracle 7 database programming language, strong understanding of SQL, PC windows and UNIX operating environment. Good oral and written communication skills. Ability to work without supervision and to solve problems. Bachelor degree in Computer Science. Two years work experience in job offered or computer application development. $1 153.85 per week, 40 hours per week. Equal opportunity employer. Application by resume. Application will be accepted up to 30 days after the date of publication. Send resume to Bernie Chidserson, P.O. Box 94600, Lincoln, NE 68509-4600. Refer to job order # NE 0158818

Manager - Customer Technical Services: Wholesale distributor of data, voice and fiber optics products and services requires a manager level oriented to direct and coordinate technical support in the fields of data, Voice and Fiber Optic Network products to management, production and sales departments and customers by developing product configuration and high end solutions, advises about the design, evaluation and marketing of data, fiber optic products and services from quality assurance standards to specifications as required by customers, to evaluate and coordinate data and fiber products including ethernet system for Local Area Network and/or Wide area Network, topology and laying out Uninterrupted Power Supply Systems. Required: Bachelors Degree in marketing and/or Marketing and two years experience Marketing Specialist in Electrical and Communications fields, and ability to formulate procedures in custom cable facility; ability to design with FDDI back bone; ability to solve and provide High End Solutions using fiber optics as a backbone and working ability to design and work on network applications topology and knowledge of fiber optics. 40 Hours per week $2,531.00 per month. Please apply with a resume in person to your local Kansas Job Service or send resume to Dept. of Human Resources KJS00143, Attn: Don Bruner, 401 S.W. Topeka Blvd., Topeka, KS 66603-3182. Applicants must have proof of legal authority to work in the United States.

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Requires 3+ years of programmer/analyst experience, 2+ years involvement with Client/Server applications, and a background in Oracle or other relational databases. Strong PowerBuilder skills are a must.

ONLINE/WWW DEVELOPERS

Requires 3+ years of C or C++ Windows development and programming, and experience with Oracle, Perl, UNIX, Java, WWW or Netscape. A design analysis background is also necessary.

SYSTEM ADMINISTRATOR

Requires 3-5+ years of installation, operation and maintenance experience in a UNIX environment. Shell script, HTML and Perl programming skills, and knowledge of TCP/IP protocols and LAN networking are essential. Familiarity with Sun OS 4.1x, Solaris, Novell and AIX is preferred.

For consideration, please send or fax your resume to: Coris, Attn: Mary DeVous, 7501 S. Quincy St., Willowbrook, IL 60521. Fax: (708) 655-7755. An equal opportunity employer m/f/d/v.

Systems Analyst. 40 hrs/wk from 8am to 5pm. Salary at $60 000/yr. Job duties to include installation, design, development, testing, maintenance and implementation of Oracle Financials for applications such as account payables, general ledger and purchasing; software development and forms development using AOL and SQL*Forms 2.3 and RW 2.0. Require B S degree with Physics, Computer Technology or Computer Science as major; must have 8 month experience in job offered or as Programmer/Analyst working on AOL, SQL*Forms 2.3 and RW 2.0. Must have proof of legal authority to work permanently in the U S. Please send resumes to Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, Illinois 60605. Attention Janet Aschenbrenner. Reference #V-IL 14799-A. An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter

Programmer Analyst: Analyzes, develops and maintains software programs, applications, and systems necessary to support end user functions in the following areas: performs application analysis, program development and testing, designs and analyzes large relational database systems and applications; provides technical support to other departments, develops application programs as related. Knowledge or work experience in AIX operating system for IBM RS/6000 computers, UNIX DOS and Windows operating environment. C C++ Shell programming languages; Informix relational database (SQL, ESQL/C 4GL). Good oral and written communication skills. Ability to work without supervision and to solve problems. Bachelor degree in Computer Science or Electrical Engineering. One year work experience in job offered. $35,000 per year. 40 hours per week. Equal opportunity employer. Application by resume. Application will be accepted up to 30 days after the date of publication. Send resume to Bernie Chidserson, P.O. Box 94600, Lincoln, NE 68509-4600. Refer to job order # NE 0159419

System Administrator: Report computer application problems to Japanese vendor and follow up. Analyzing problems and document the symptom. Computer trouble shooting, compiling database and review through Japanese vendor. Providing assistance in solving computer systems problems. Providing on-line help to local staff of regional offices and within Head Office as well. Purchasing and leasing hardware/software inventory, software licensing, cost analysis. Maintenance of records of payments and contracts with the vendors and other agencies. Serving as a liaison between System Dept. and Accounting Dept. and a parent company in Japan. Must be fluent in English and Japanese; requires occasional travel to Japan (15%). Bachelor Degree in Business Administrative Systems and 2 yrs direct experience required. Salary offered $43,500/yr. 40 hrs/wk. 9-5, M-F, 8.1. 10 hrs/wk. *Must have proof of legal authority to work permanently in the U S. Send 2 copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 S. State St. - 3 South, Chicago, IL 60605. Attn: LEILA JACKSON. Reference #V-IL 14051-J. No calls. An employer paid ad.

Software Engineer Milwaukee, WI information technology consulting firm seeks 2 individuals to identify user requirements in mainframe & PC environments, including client/server. DUTIES: Design, develop, implement, & maintain software applications, evaluate user requests for enhancements $ modifications to existing applications, analyse & develop specs to determine feasibility, cost, time required to implement $ determine compatibility w/ current system, consult w/user to clarify application objectives. REQUIRES: Bach degree w/ comp sci or comp engrg major. ALSO REQUIRES: 3 yrs exper as programmer/analyst or systems analyst, w/ at least 3 yrs exper utilizing ADABAS, Natural, SAS, & ORACLE to MVS/SP-IBM mainframe or PC environment. SALARY: $40,000 to $4,000. 40 hr wkly week, Mon-Fri/8 am-5 pm. SEND 2 COPIES OF RESUME TO TRAVIS BARTEL, JETS, PO BOX 7972, Madison, WI 53702-7972. REFER TO CASE NO. 860143.

COMPUTER ARCHITECT Responsible for (i) database administration of an Informix 7.10 database server on U-6000 platform, (ii) system administration of a U-6000 System V UNIX server and peripherals (iii) analyzing new software and hardware to determine usefulness and compatibility with existing data software and systems. Duties will include redesigning the graphical visual interface client to the database server using Visual C++. Position responsibilities include programming in (i) C++ using SNA class libraries in the Windows Borland C++ environment, (ii) in C/Embedded SQL-Structured Query Language to maintain Informix 7.10 database and (iii) in Informix 4GL to generate required reports against database. Require experience with the following: image rendering and compression networking protocols and 32 bit operating systems, systems/application analysis, design & programming in C/C++, SQL, Visual C++, Informix 4GL & shell scripting in the UNIX and DOS environments; administration of Informix databases and UNIX systems. Position requires a master's in computer engineering with the equivalent of 3.5 on a 4.0 scale and at least one year professional experience. Expertise must be demonstrated by at least one year professional experience. Expertise must be demonstrated by at least one year professional work experience, job references, documenting skills and job projects, and academic work. Academic work may include formal coursework and/or thesis or dissertation projects. Position requires a master's in computer engineering with the equivalent of 3.5 on a 4.0 scale and at least one year professional experience. M-F 8:30am-5:00 pm, 40 hours a week. Annual salary $45,589. Send two copies of resume, academic credentials and two letters of recommendation to Ms. Cathy S. Phillips, SC Employment Security Commission, E&T Technical Services, P.O. Box 1406 - SC2000522, Columbia, SC 29202

PROGRAMMER ANALYST (2 positions) 40 hrs./wk. 8am-5pm. $42,940/yr. Carry out installation and testing of a S/W application package on IBM RS/6000 computer under AIX environment utilizing "C". Require Bachelor's degr. in Computer Science, Electronics or Mechanical Engrng. and 2 yrs. expr. in job offered or 2 yrs. expr. in Systems Analysis &/or Programming &/or S/W Engineering &/or Computer Consulting. Require experience in development of S/W application systems under AIX environment utilizing "C". Employer is computer consulting S/W development firm. Relocation to various client sites throughout the U.S.A. for period of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #28096.

Consultant 40hrs/wk. 9am-5pm. $48,000/yr. Design, develop, implement & test software applications for manufacturing & financial systems. Technical training & support. Tools: BPCS, AS/SET CASE tool, AS/400, RPG/400, CL 400, Query/400, SQL/400, B.S. in Computer Science as well as two years experience in job offered or as "Programmer/Systems Analyst" required. Previous experience must include: development & implementation of manufacturing & financial applications system development methodology, AS/400, RPG/400, CASE tools. Must have proof of legal authority to work permanently in the U.S. Send resume to: Carry Sutton, WHITTMAN HART, INC., 311 S. Wacker Dr., Ste. 3500, Chicago, IL 60606 (312) 913-3433

EDI SOFTWARE ENGINEER required. Development & support of Electronic Data Interchange (EDI) solutions using expertise with Value-Added Networks (EDI interaction with data communication networks) & EDI interfaces to applications systems. Programming & maintenance using IMS DB/DC, PL/1, DB2, COBOL II, JCL & ISPF/TSO as well as Jackson & other structured methodologies on MVS Mainframe, OS/2 & DOS environments. Two years experience required in the job duties described above. Experience must include one year of applications development & support for the DataInterchange Management & Trading Environment & the DataInterchange EDI translator package (both softwares developed & marketed by Advantis, a Sears-IBM partnership). Must have proof of legal authority to work in the U.S. Salary - $38,000/year for a 40 hour work week. Interested applicants contact the Oklahoma State Employment Service, 110 S. Hartford, Suite 108, Tulsa, OK 74120 (ID#7207). Refer to J.O. #210338. Ad paid by an Equal Opportunity Employer

SOFTWARE ENGINEER required. Design & implementation of C++ applications & system simulations on distributed UNIX platforms using Rumbaugh's methodology & STP (Software through Pictures). User interface design in X/Motif & Widget programming with database development using entity relationship diagrams & table development using Oracle & Oracle Suite Utilities. UNIX system programming using Sockets & inter-process Communications (IPC) utilities & Shell Scripts for systems administration. Masters Degree or its equivalent required in Math, Computers or Engineering, plus 1 year experience in the job duties described above. University work experiences (other than mere classroom study) may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary - $50,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. J.O. # TX7505280. Ad paid by an Equal Opportunity Employer

Software Engineer 40hrs/wk. 9am - 5pm. $[illegible],000/yr. Design & develop software for management information systems. Projects include: object-oriented programming & design, data communications; relational database management; graphical user interface (GUI) design. Tools: C/UNIX, X-Windows/Motif, TCP/IP, dbase, Assembler. M.S. in Computer Science as well as two years experience in job offered or as Systems Engineer required. Previous experience must include design of management information systems using C/UNIX, dbase, & Assembler. Graduate education must include one project each on object-oriented programming with GUI (X-Windows/Motif) & TCP/IP network interface. Must have proof of legal authority to work permanently in the U.S. Send two copies of cover letter & resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Joan Systus. Reference #V-IL-14563-S. No CALLS. An Employer Paid Ad

Programmer/Analyst (Terre Haute, IN client sites) Analyze, design, develop, implement, and test programs for commercial and financial applications systems using NATURAL and ADABAS on IBM mainframes. Bachelor's degree in Comp. Sci., Math, or Engineering, and 2 yr. exp. in job req. 35 hrs/wk, 9:00 am - 5:00 pm. $36,000/yr. Send resume w/ Soc. Sec. No. to the Indiana Department of Workforce Development, 10 N. Senate Avenue, Indianapolis, IN 46204-2277. Attn: Gene R. Replogle, I.D. #3379649

SOFTWARE ENGINEER. (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m. $55,480/yr. Carry out systems analysis, systems design, including functional and technical specifications, customization coding, testing and implementation of software application systems on UNIX environment utilizing INGRES and C, and perform project management duties. Reqr. Bachelor's degree in Computer Science or Electronics or Mechanical Engineering. Reqr. 4 yrs. expr. in job offered, or 6 yrs. expr. in Systems Analysis &/or Programming &/or Engineering &/or Computer Consulting. Reqr. work expr. in dev. of s/w systems and with Unix environment, INGRES and C. Employer is a s/w development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 42596.

SOFTWARE ENGINEER (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m. $49,000/yr. Carry out systems analysis, systems design, coding and testing of computer software application systems on Unix environment utilizing ORACLE, VISUAL BASIC and C. Reqr. Bachelor's degree in Computer Science or Electronics or Mechanical Engrng. Reqr. 4 yrs. expr. in job offered, or 4 yrs. expr. in Systems Analysis &/or Programming &/or S/W Engrng. &/or Computer Consulting. Reqr. work expr. in dev. of s/w systems on Unix environment and with ORACLE, C and VISUAL BASIC. Employer is a s/w development/consulting firm. Relocation to client sites throughout U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 45896

SOFTWARE ENGINEER required. Applications design & systems development using Information Engineering methodology, IEF CASE Tools, Central Encyclopedia, COBOL & C programming, CICS TP Monitor, DB2 & DB2/2 databases & ORACLE RDBMS. Primary development on OS/2, UNIX & MVS platforms with usage of JCL. Bachelor's Degree or its equivalent required in Math, Computers or Engineering, plus 2 years experience in the job duties described above. Must be willing to relocate to various unanticipated worksites throughout the USA every 4 to 10 months-Employer Paid. Must have proof of legal authority to work in the U.S. Salary-$56,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. J.O. #TX7505279. Ad paid by an Equal Opportunity Employer

Systems Analyst - client sites in Chicago, IL & Co loc in Lisle, IL. Analyze, design, develop & maintain client/server applications using structured programming & object-oriented programming on multiple platforms. Use C Set/2, DB/2, APPC, LU6.2, OS2/PM, ENFIN/3, SMALLTALK on IBM PC's. Bachelors/Engg. Math or Comp. Sci. 2yrs/exp. in job offered or 2yrs as S/ware Engr. &/or Systems Analyst &/or Prog/Analyst. Exp in job offered or related occ must incl 1yr using C Set/2, DB/2, APPC, LU6.2, OS2/PM, ENFIN/3, SMALLTALK on IBM PC's in an object-oriented environment. 40hrs/wk (8-5, M-F) $52,000/yr. Must have proof of legal authority to work permanently in the U.S. Send both resume and cover letter in dupl. to: Illinois Dept. of Employment Security, 401 South State St. - 3 South, Chicago, IL 60605. Att: Dennis Jones. Ref # V-IL 14157-D. NO CALLS. AN EMPLOYER PAID AD

Programmer/Analyst (Atlanta, GA locations) Analyze, design, develop, and implement programs for commercial and financial applications systems using RPG/400 in an IBM AS/400 environment. Bachelor's degree in Comp. Sci., Math, or Engineering, and 2 yr. exp. in job req. 40 hrs/wk, 8:30 am - 5:00 pm, $36,540/yr. Apply in person or send resume to: Georgia Department of Labor, J.O. # GA 5061916, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909, or the nearest Department of Labor Field Service Office

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Orange County Government in Orlando, FL is currently seeking a qualified professional to fill this highly responsible position. This individual will be expected to direct, plan, organize, and coordinate the activities of the County's data management and application development and support.

Successful candidates will possess a minimum of a Bachelor's Degree in Business Administration, Computer Science, or a closely related field (Science and Math). Candidates must also have seven (7) years of recent, progressively responsible management experience in relational database management and software product selection, development and support responsibilities in a mainframe or midrange systems environment. Experience should include staff supervision of workforce with forty (40) or more employees, budget management in excess of five million dollars, and familiarity with geographic information systems.

Preference will be given to candidates who are experienced in product development and support in a client/server environment.

Competitive salary commensurate with education and experience to include an excellent benefits package. Please direct inquiries and resumes by April 15, 1996, to **Orange County Government, Human Resources Department, Position #96-2107, 201 South Rosalind Avenue, Orlando, FL 32801, 407-836-8000, FAX: 407-836-6380.** EEO M/F/D

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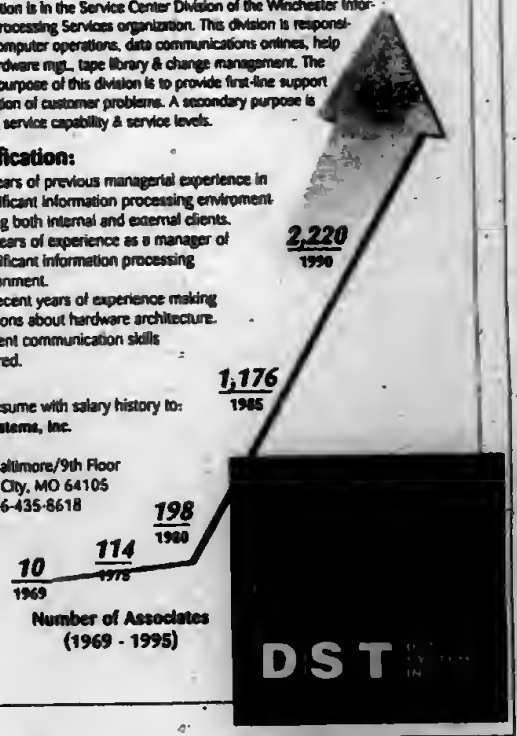

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The Associate Administrator for Research and Acquisitions of the Federal Aviation Administration (FAA) is seeking two Senior Scientists to support the mission of providing research, development, and acquisition expertise for products and services that ensure a safe and efficient National Airspace System (NAS).

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Senior Systems Analyst

Organon Teknika is currently seeking an experienced Senior Systems Analyst to support all MANMAN applications. This individual will be responsible for meeting user business needs by modifying existing MANMAN programs and writing UDMS programs. The candidate will perform emergency maintenance and lead implementation efforts of new MANMAN releases. Salary range 37[illegible] depending on experience with fair relocation benefits.

Qualifications include:

- Bachelor's degree with minimum of 5 years' experience
- **VMS Fortran/DBMS experience**
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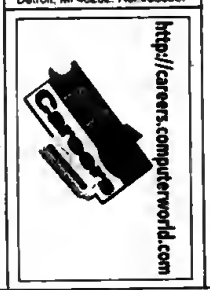
SOFTWARE ENGINEER required. Analysis, design & construction of application software using Information Engineering Facility (IEF) CASE tools for OS/2, Windows & MVS development environments & COBOL & C programming languages. Use GUI & Client/Server development techniques with IEF & advanced knowledge of IEF's Central Encyclopedia, DB2, DB2/2 & CICS TP Monitor. Bachelors Degree or its equivalent required in Math, Computers or Engineering, plus 2 yeam experience in the job duties described above. Must be willing to relocate to various unanticipated worksites throughout the USA every 4 to 10 months. Employer Paid. Must have proof of legal authority to work in the U.S. Salary: $57,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, J.O. #TX7505282. Ad paid by an Equal Opportunity Employer.

PROGRAMMER ANALYST (2 positions) 40 hrs./wk., 8am-5pm, $42,940/yr. Carry out program analysis, coding & testing of application S/W programs under UNIX or DOS environment utilizing MS-Windows, C and a relational database such as ORACLE or SYBASE or INFORMIX. Require Bachelor's degr. in Computer Science, Electronic or Mechanical Engrng and 2yrs. expr. in job offered or 2 yrs. expr. in Systems Analysis &/or Programming &/or S/W Engineering &/or Computer Consulting. Require experience in programming utilizing MS-Windows and C. Employer is S/W consulting/development firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad". E.O.E. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #31496.

Consultant. 40hrs/wk., 9am - 5pm, $51,000/yr. Lead teams in the design, development, implementation & testing of software for management information systems. Graphical User Interface development. Database design & development, including data modeling, data diagrams & performance tuning. Tools: SQL Forms; SQL Reporterwriter; SQL Menu; ORACLE, ORACLE CASE; INGRES, COBOL, UNIX. M.S. in Computer Science, Math, Electrical Engr. or Physics as well as one year experience in job offered or as Programmer or Systems Analyst required. Previous experience must include: ORACLE; project leadership; COBOL; UNIX; INGRES. Must have proof of legal authority to work permanently in the U.S. Send resume to: Cathy Sutton, WHITTMAN-HART, INC., 311 S. Wacker Dr., Ste. 3500, Chicago, IL 60606. (312) 913-3433.

PROGRAMMER ANALYST (2 positions) 40 hrs./wk., 8am-5pm, $42,465/yr. Carry out coding & testing of software application programs utilizing "C" and relational databases such as ORACLE or SYBASE or DB2 under UNIX environment. Require Bachelor's degr. in Computer Science, Electrical or Mechanical Engrng. and 2 yrs. expr. in job offered or 2 yrs. expr. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Require experience with UNIX and "C". Employer is S/W development/consulting firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #33696.



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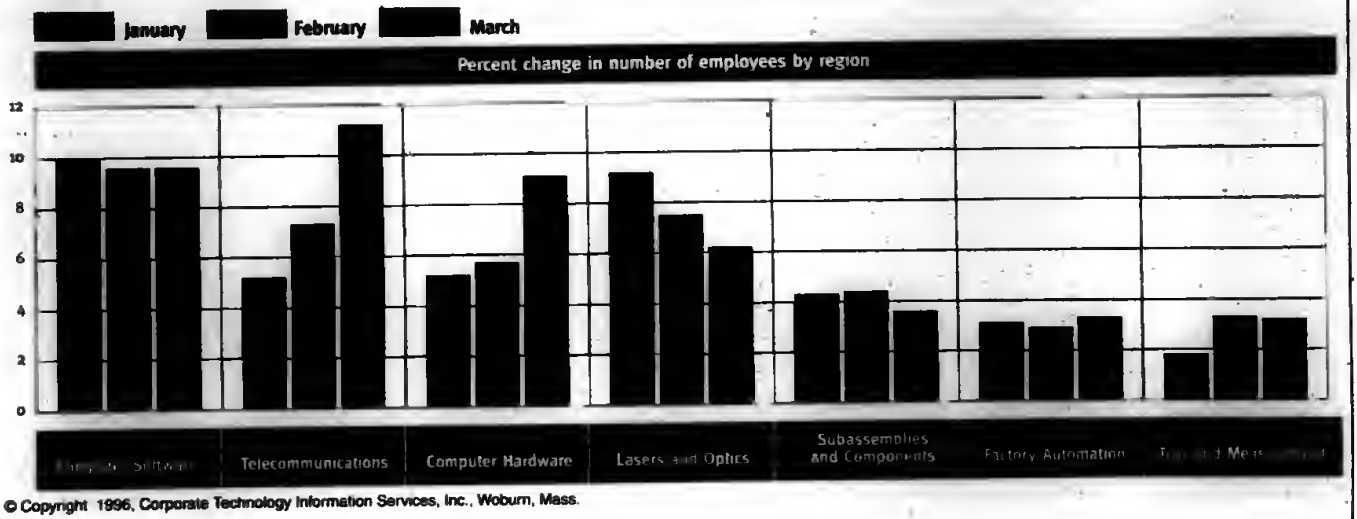

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EDI/EC Specialists - BS degree in computer science or equivalent. 3-5 years experience in implementing EDI/EC applications. For EDI positions, a programming and transaction mapping background is required using X.12, UN/EDIFACT, or TDCC standards. For EC positions, experience in developing mail enabled, internet, EFT or other EC related applications is required using one or more of the following technologies: X.435, X.500, TCP/IP, Lotus Notes, Perl, HTML, CGI, Java, RSA/DSA encryption.

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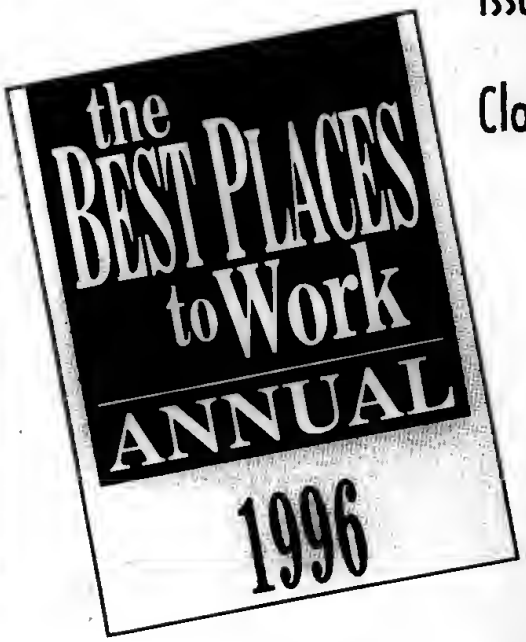

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Marketplace

Trimming telecommuting's price tag

By Suzanne Hildreth

YOUR COMPANY HAS DECIDED TO SUPPORT TELECOMMUTING. WHAT WILL IT COST? THAT DEPENDS ON YOUR APPROACH.

First, investigate your options. There is oo single telecommuting scenario or price tag. "At one extreme, you have paper, pencil and telephone. At the other, you've got a full-powered programmer's workstation, ISDN line, fax machine and so on," says Gil Gordon at Gil Gordon Associates, a consulting firm in Monmouth Junction, N.J.

The price of telecommuting depends on the level of sophistication required — used Intel Corp. 386-based machines vs. new Pentiums and analog lines vs. Integrated Services Digital Network (ISDN) — and how many extras the company is willing to support.

SOME CASES IN POINT:

- When Sun Microsystems, Inc. created a telecommuting program for 700 of its San Francisco-area employees, it opted for high-end ISDN lines and Sun SPARCstations that cost $5,000. Sun pays about $180 per worker per month for its ISDN connections, which includes usage charges and support from Pacific Bell.
- Aegon USA, Inc.'s Advanced Financial Services Division in Clearwater, Fla., is poised to implement a telecommuting program that will cost between $6,000 and $8,000 per worker and $300 in monthly communication and support expenses. The price includes extras, such as furniture for the insurer's home offices, and standard items including 486-based PCs and 28.8K bit/sec. dial-up access to the corporate LAN.
- Nynex Corp. employees in Boston are telecommuting on an ad hoc basis until a formal policy is unveiled later this year. Joan O'Brien, a staff manager, telecommutes two days a week and uses her own PC and printer. Aside from an extra phone line, Nynex bears none of the cost of O'Brien's telecommute.

SOME ADVICE

Between 6 million and 8 million Americans telecommute, according to Gordon, and probably no two work in exactly the same way. Fortunately, there are guidelines for information systems managers charged with implementing a telecommuting program. Gordoo and other experts offer the following advice:

- Don't pinch pennies at the expense of productivity. If you foist antiquated PCs oo telecommuters who oeed lots of RAM or skimp on crucial features such as fax modems, it can cost you more later for IS support and telecommuter downtime.

"You don't want to save a few dollars on your hardware when it's going to reduce the productivity of a resource, namely the employee, that's costing $50,000 to $100,000 a year," says Dan Merriman, a director at Giga Information Group, a market research firm in Cambridge, Mass.

But not every telecommuter needs a $4,000 PC. Many telecommuters can make do with older machines or press their home PCs into service. And some companies buy a pool of laptops that telecommuters can share, Gordon says.

- Don't forget voice communications. It's the one area that is often oeglected. Not all telecommuters need frequent voice contact with the office, but those who do can be seriously hampered in their jobs without it. They may need a call-routing service that forwards calls from the office to the worker's home.
- Shop around. The most expensive part of telecommuting is the cost of connectivity, and there are many options and prices from which to choose. "You need to be pretty aggressive in dealing with the telecom providers. Really lean on them to come up with a cost-effective plan," Gordon says.

One way to save may be to use special telecommuter programs offered by on-line services such as CompuServe.

Or let a national or regional carrier network relieve you of the burden of purchasing, configuring and maintaining a remote access server to support telecommuters.

"They deal in quantities of hundreds; so you don't have to worry about things [such as] the ratio of ISDN to analog users," says David Goodtree, an analyst at Forrester Research, Inc. in Cambridge.

- Don't underestimate the cost of increased IS support. "People think of the cost of the PC, and of the communication costs, but neglect the cost of supporting remote hardware and software," Merriman says. An upfront investment in training can help reduce those support costs.

The tab for telecommuting

Sample estimated costs for a home-based teleworker

Support: $500 one-time fee, $347 in annual costs
Network: $203 one-time fee, $1,282 in annual costs
Home equipment: $3,522 one-time fee, $494 in annual costs
Corporate setup: $237 one-time fee, $35 in annual costs
Total: $4,462 one-time fee, $2,158 in annual costs

Source: Forrester Research, Inc.

The payback

Three areas where you could expect to recoup the cost of telecommuting

25-75% reduction in office space and associated costs
10-50% increase in productivity
20-40% reduction in recruitment and turnover costs

Source: Telework Training International

Jan Sherwin, director of process reengineering at Nynex and developer of Nynex's soon-to-be-introduced employee telecommuting program, says, "There are 15 or 20 basic questions most remote workers will have. If you can provide them with some sort of overview of the technology, you can mitigate the problems." ■

Hildreth is a freelance writer in Boston.

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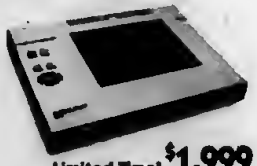

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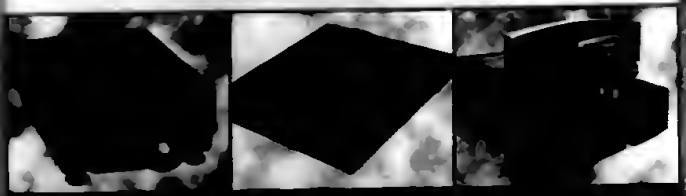

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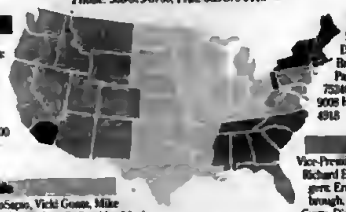

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AT&T lets Lucent

Analysts rate the mammoth IPO a strong long-term buy

By Tam Harbert

As the world's largest maker of telecommunications systems, Lucent Technologies, Inc. is likely to be a strong, long-term investment. Yet it will probably be a volatile one for the short term, financial and industry analysts agree.

The new company, an AT&T Corp. spin-off, is offering about 17% of its shares in an initial public offering (IPO) this month. The IPO is expected to raise $3.3 billion. The shares will be traded on the New York Stock Exchange under the proposed ticker symbol of LU.

The volatility stems from the Murray Hill, N.J.-based company's struggle with a kind of split personality. On the one hand is Lucent's stable, traditional role as a major provider of telecommunications systems. On the other hand, it is entering the world of network convergence with products in high-profile, high-growth areas such as data networking, network management software and wireless communications.

Don Dixon

"If you're a stock analyst, you have an interesting decision to make on how to value this IPO," depending on whether the traditional or the high-profile markets are emphasized, says Peter Bernstein, president of Infonautics Consulting, Inc., a telecommunications market research company in Ramsey, N.J.

Either way, the company stacks up as a formidable competitor. It is a leader in the telecommunications infrastructure "and can make a strong case that it will continue to dominate that business," he notes.

Lucent also has key assets in several high-tech markets. Bernstein notes that $2 billion of the company's $21 billion in revenue comes from software. That is significant competition for other networking software providers.

"Lucent is a major provider of software, but people don't see it because it's not off the shelf," agrees Allan Sulkin, president of TeqConsult Group, a consultancy in Hackensack, N.J. In addition, the company will be competing with LAN and WAN equipment providers.

Evaluating Lucent

Watch Lucent's performance in these key areas, analysts say:

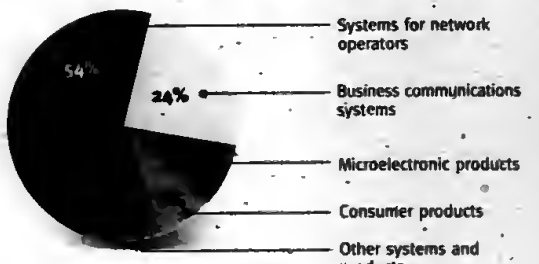
- Increased synergy between the networking systems and the business communications systems units.
- Prompt introduction of new products in data communications, wireless communications and software.
- Continued growth in international business. In 1995, only 23% of the company's revenue was generated overseas.
- Marketing that is effective in reidentifying the company's image in the marketplace.

An appropriate company to use as a competitive benchmark for Lucent is Northern Telecom, Inc., analysts say. Although only half the size of Lucent, the $10.6 billion Nortel is similar in its markets and product lines.

"Whatever Nortel's selling at, Lucent would like a larger multiple," Sulkin notes.

Although Lucent reported a net loss of $853 million for 1995, that number is due to onetime restructuring costs, says Michael Arellano, an analyst at Northern Business Information, a telecommunications market research company in New York. When the after-tax value of the restructuring costs are added back in, Lucent emerged with a respectable net income of $994 million.

Lucent's 1995 $21.4B revenue breakdown



Source: Securities and Exchange Commission filings

Start your (search) engines

By Randy Weston

Investors can hardly go wrong this month with the plethora of new public offerings from such Internet start-ups as Yahoo, Lycos and Excite, three of the most-used net search engines.

"You can't pick an IPO of a company in broadband or Internet technology that hasn't gone through several splits and several 100% returns," says Christine Heckart, a consultant at TeleChoice, Inc. in Verona, N.J. "I doubt if there's any such thing as no-risk investing, but this is pretty close."

Lycos, Inc. [LCOS] in Marlboro, Mass., and Excite, Inc. [proposed symbol: XCIT] in Mountain View, Calif., hit the Nasdaq board last week, each with 1.3 million shares up for grabs at $12 to $14 a share.

Sunnyvale, Calif.-based, Yahoo [proposed symbol: YHOO], owner of the most well-known search engine, is expected to have an even more spectacular debut. With 2.6 million shares being offered on the Nasdaq exchange in mid-April, analysts predict Yahoo will skyrocket to three or four times its initial value of $10 to $12 per share.

Heckart, however, cautions that investors can get burned in this kind of "feeding frenzy."

All three companies sprang recently from academia and have little or no past business history that investors can use to judge future performance.

For example, Yahoo, a tiny operation with less than 40 employees, was launched a little over a year ago as a school project by two Stanford University graduate students — David Filo, 29, and Jerry Yang, 27. It quickly developed into the pre-eminent net search tool but didn't start generating advertising revenue until August 1995.

In its prospectus, Yahoo lists 27 risk factors, including its relative inexperience, recent management changes and growing competition from companies such as Digital Equipment Corp. [NYSE:DEC], which offers the Alta Vista search engine.

The Week in Stocks

Gainers

PERCENT

Hamilton Beach Inc.	37.8
Dialogic Corp. (N)	31.3
Amdahl Corp.	30.8
Xylan Corp.	29.5
Radius Inc.	26.3
Iomega Corp. (N)	23.7
Group 1 Software	21.1
Control Data Systems Inc.	19.0

DOLLAR

Xylan Corp.	15.19
Iomega Corp. (N)	4.25
Shared Medical Systems (N)	4.00
Silicon Corp. (N)	3.79
Arbor Software	3.00
Ascend Communications	4.88
IBM	4.38
Reynolds and Reynolds (N)	4.25

Losers

PERCENT

Hyperion Software Corp.	-18.6
FTP Software Inc.	-23.8
Filmet Corp.	-18.4
Banyan Systems Inc.	-16.1
Interleaf Inc.	-14.9
Cray Research Inc.	-14.7
Wordtech	-11.5
Sequoia Systems Inc. (L)	-10.2

DOLLAR

Hyperion Software Corp.	-10.50
Filmet Corp.	-9.50
Business Objects	-6.00
Cray Research Inc.	-4.13
Stratacom Inc.	-3.63
Security Dynamics Tech.	-3.50
Peoplesoft (N)	-3.38
FORE Systems Inc.	-3.00

Industry Almanac

Zipping along

Although highly volatile, **Iomega Corp. (NASDAQ:IOMG)** stock is on a roll, analysts say.

Joseph Besecker, an analyst at Emerald Research in Lancaster, Pa., has a strong buy on Iomega. With its Zip drive, it's trying to set a standard for removable storage for PCs, he says.

"I believe they have an excellent chance to accomplish that goal," Besecker says. "A lot of the other companies haven't responded as quickly as they should have, giving Iomega a significant head start."

The company faces a considerable challenge from Compaq Computer Corp., which recently introduced its LS-120 drive. The product was jointly developed by Compaq, 3M Corp. and Matsushita-Kotobuki Electronics Industries Ltd., whose U.S. division is Panasonic.

That triumvirate is a powerful force in setting standards, bears note. However, Iomega's savvy marketing skills weigh heavily in its favor, analysts say.

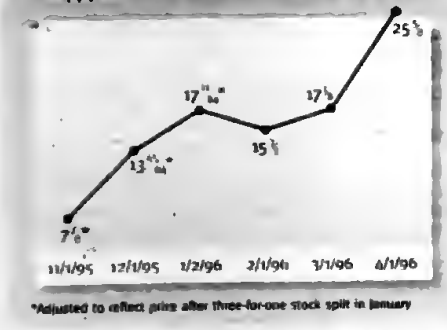
"We're extremely enthusiastic about the company's product line and about its heavy emphasis on consumer marketing," says Howard Rosencrans, senior security analyst at Howard D. Brous & Co. in Great Neck, N.Y. The company in March reiterated a strong buy rating for the stock.

He expects Iomega's sales this year to reach the $1 billion level, up from $335 million last year.

"Companies with this sort of momentum are extremely rare, and we advise investors to take notice — now," Rosencrans said in his report. — *Tam Harbert and Stewart Deck*

Zip-a-dee Doo-Dah

Iomega's stock price has been whistling a happy tune with the success of the Zip drive



*Adjusted to reflect price after three-for-one stock split in January

Exch	52-Week Range			Apr. 4 Close	Wk Net Change	Wk Pct Change
[illegible]						
COMS	53.63	25.75	3 COM Corp	37.25	2.69	-6.7
AIT	66.88	41.25	AMERITECH Corp	56.75	0.00	0.0
AXE	22.13	16.00	ARNTER INTL	16.50	-0.38	-2.2
APTS	15.00	2.75	APERTUS TECH	3.75	0.06	1.7
T	68.88	47.88	AT & T	63.88	1.63	2.7
ASND	58.75	7.88	ASCEND COMMUNICATIONS	58.75	4.88	0.0
BNYN	18.63	8.00	BANYAN SYSTEMS INC	6.50	1.25	-14.1
BAY	50.00	21.75	BAY NETWORKS INC.	28.88	2.25	7.2
BRN	68.75	16.50	BRN CORP.	75.13	-0.25	-1.0
BEL	90.38	52.00	BELL ATLANTIC CORP	62.00	-0.38	-0.6
BLS	45.88	29.13	BELLSOUTH CORP	37.13	-0.38	-1.0
BMKT	37.25	9.13	BROOKTROUT TECHNOLOGY	35.25	1.75	5.2
CS	87.75	43.00	CABLETRON SYSTEMS	66.25	-0.50	-0.7
CSCC	92.75	20.38	CASCADE COMMUNICATIONS (H)	90.25	-0.13	-0.1
CGRM	25.13	12.75	CENTIGRAM COMMUNICATIONS	22.50	0.50	2.3
CSCO	51.00	18.50	CISCO SYSTEMS INC	68.50	1.38	2.2
CLX	11.38	4.50	COMPRESSION LABS INC. (L)	6.81	-0.50	-10.5
CMNT	12.75	4.00	COMPUTER NETWORK TECH.	5.50	-0.13	-2.2
XCOM	14.50	8.75	CROSSCOMM	11.50	1.00	9.5
DIGI	84.00	21.88	DSC COMMUNICATIONS	24.63	-2.13	-7.9
FORE	75.00	25.50	FORE SYSTEMS INC	69.00	-3.00	-4.2
GDC	21.88	9.25	GENERAL DATACOMM INDS	11.13	0.38	3.5
GSX	42.50	28.00	GENERAL SIGNAL NETWORKS	26.13	-0.38	-1.0
GTE	49.25	31.88	GTE CORP	43.38	-0.63	-1.4
MCIC	31.13	19.09	MCI COMMUNICATIONS CORP. (H)	29.88	-0.50	1.6
MICM	12.50	5.50	MICOM COMMUNICATIONS CORP	8.50	-0.25	-2.9
MNPI	34.50	9.13	MICROCOM INC	20.00	0.38	1.3
NETM	34.00	9.38	NETMANAGE INC	10.00	-1.13	-10.3
NTRX	8.75	3.63	NETRIX CORP	6.75	-0.75	-9.0
NCDI	12.00	3.38	NETWORK COMPUTING DEVICES	3.75	-0.25	-6.1
NWK	42.00	18.75	NETWORK EQUIPMENT TECH.	30.88	0.38	1.2
NETG	46.50	22.75	NETWORK GENERAL	38.50	-0.25	-0.6
NN	57.13	25.00	NEWBRIDGE NETWORKS CORP. (H)	56.50	-2.13	-3.8
NT	56.88	31.50	NORTHERN TELECOM LTD	49.25	1.38	2.9
NOVL	23.25	11.38	NOVELL INC	13.50	-0.13	-0.9
NVR	59.25	39.25	NYNEX CORP	52.00	1.38	2.7
OCTL	50.50	18.00	OCTEL COMMUNICATIONS CORP. (H)	49.75	0.75	1.5
OOSI	43.25	17.00	OPTICAL DATA SYSTEMS INC.	20.00	-0.13	-0.6
PCTL	44.72	17.00	PICTURETEL CORP	30.25	-1.88	-5.8
PTON	10.75	4.75	PROTEON INC	9.25	0.13	2.4
RACO	7.88	4.25	RACOTEK INC	4.00	0.00	0.0
RETX	6.13	1.81	RETIX (H)	6.00	1.00	20.0
SFA	24.63	11.38	SCIENTIFIC ATLANTA INC.	17.88	0.25	1.4
SHVG	101.75	28.25	SHIVA CORP. (H)	88.50	5.75	6.2
SBC	60.25	41.63	SOUTHWESTERN BELL CORP	49.75	-3.00	-5.2
FON	45.50	39.25	SPRINT CORP	38.63	0.25	0.7
SMSC	23.50	12.50	STEROPHO MICROSYSTEMS CORP	15.63	-0.25	1.6
STRM	44.50	16.00	STRATACOM INC	33.25	-3.69	-9.8
TBIT	8.63	2.38	TELEBIT CORP	5.69	0.50	11.0
USRX	139.75	31.13	US ROBOTICS	127.00	-3.00	-2.3
USW	68.38	28.38	U S WEST INC	33.13	0.38	1.1
XIRC	15.38	8.88	XIRCOM	13.63	0.25	1.9
XYLN	67.00	51.25	XYLAN CORP	67.00	15.25	29.5
[illegible]						
AAL@	9.63	4.50	ADVANCED LOGIC RESEARCH	7.00	0.38	5.7
AAPL	50.13	23.00	APPLE COMPUTER INC	26.13	0.00	0.0
ASTA	19.13	4.63	AST RESEARCH INC	5.00	0.25	5.3
CPQ	56.75	31.13	COMPAQ COMPUTER CORP	37.63	-1.00	2.6
DELL	49.38	21.25	DELL COMPUTER CORP	30.63	2.00	5.8
GATE	37.50	16.00	GATEWAY 2000 INC	30.00	2.13	7.6
HWP	104.13	59.50	HEWLETT PACKARD CO	96.38	0.00	0.0
MUEI	28.88	9.00	MICRON INTERMEDIAL INC.	10.00	0.13	1.3
NPNY	75.13	51.00	NEC AMERICA	58.18	0.50	0.9
SGI	45.63	21.13	SILICON GRAPHICS	25.25	0.25	1.0
SUNW	57.13	17.00	SUN MICROSYSTEMS INC	46.13	1.63	3.7
[illegible]						
AMH	11.63	6.75	AMDAHL CORP	10.86	2.56	30.8
CYR	29.25	10.13	CRAY RESEARCH INC	24.88	-4.13	14.7
DGN	19.13	7.13	DATA GENERAL CORP	16.00	1.13	7.6
DEC	76.50	35.13	DIGITAL EQUIPMENT CORP	53.63	-1.50	-2.7
IBM	228.88	82.25	IBM	117.75	4.38	3.9
MRCD	16.13	3.00	MERIDIAN DATA INC	14.13	3.88	37.8
NETF	7.50	0.25	NETFRAME	4.63	-0.50	9.8
SQNT	25.38	10.13	SEQUENT COMPUTER SYS.	12.25	0.50	4.3
SEQS	10.00	2.88	SEQUOIA SYSTEMS INC. (L)	3.13	-0.38	10.7
SOA	38.13	23.00	STRATUS COMPUTER INC	27.63	0.13	0.5
TDM	17.50	8.75	TANDEM COMPUTERS INC	8.88	0.00	0.0
TRCD	5.75	2.00	TRICORD SYSTEMS	4.00	0.13	5.2
UIS	13.63	5.50	UNISYS CORP	5.88	-0.13	-2.1
[illegible]						
ADBE	74.25	30.00	ADOBE SYSTEMS INC	32.50	0.38	1.2
AMSWA	8.75	3.50	AMERICAN SOFTWARE INC	4.50	0.75	20.0
APLX	41.75	8.25	APPLIX INC	39.00	3.75	9.1
ARSW	49.00	28.75	ARBOR SOFTWARE (H)	49.00	5.00	11.4
ACAD	53.00	27.75	AUTODESK INC	38.75	0.75	0.6
BACH	11.88	4.50	BACHMAN INFO. SYSTEMS	8.94	0.44	5.1
BGSS	42.00	28.00	BGS SYSTEMS INC	34.31	-0.94	-2.7
BMCS	61.38	27.63	BMC SOFTWARE INC	57.50	2.69	4.9
BOOL	26.38	18.25	BOOLE AND BABBAGE	25.50	-0.25	-1.0
BORL	21.25	7.75	BORLAND INT'L INC	18.25	0.50	2.8
BOBJY	93.75	28.75	BUSINESS OBJECTS	39.38	-6.00	-2.1
CESW	3.94	1.38	CE SOFTWARE	2.63	0.13	5.0
CVE	27.88	12.38	CHEYENNE SOFTWARE INC	19.63	-0.25	-1.6
COGNF	63.25	18.88	COGNOS INC	56.38	1.38	2.4
CA	76.50	37.00	COMPUTER ASSOCIATES	72.00	-0.63	-0.9
CVN	15.50	6.75	COMPUTERVISION CORP	9.25	-0.88	-8.6
CPWB	17.00	15.50	CORDWARE CORP	23.25	0.38	1.6
LSDE	27.25	10.13	COMSHARE INC	21.75	0.00	0.0
COSFF	19.50	8.38	COPEL CORP	9.13	-0.75	-7.8
DWTI	16.00	5.25	DATAWARE TECHNOLOGIES INC	6.38	0.11	2.0
DSLGF	12.75	9.75	DISCRETE LOGIC INC	13.25	-0.25	1.9
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DDDDF	8.25	3.16	ATH DIRECTSHOP	5.25	-0.75	-4.4
FTPS	40.63	8.50	FTP SOFTWARE INC	9.50	2.81	27.8
GSOF	26.00	7.50	GROUP 1 SOFTWARE	9.00	1.69	21.1
GPT6	11.50	4.88	GUPTA	6.00	-0.56	-10.1
HYSW	28.38	11.13	HYPERION SOFTWARE CORP	11.13	10.50	48.6
IRK	18.63	10.00	INFORMATION RESOURCES	14.01	0.25	1.7
IFMX	36.75	10.63	INFORMIX CORP	25.50	1.50	-5.6
INGR	20.13	10.00	INTERGRAPH CORP	15.63	0.50	3.1
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ISLI	26.25	8.75	INTERSOLV INC	[illegible]	0.19	1.6
INTU	69.50	30.63	INTUIT INC	[illegible]	1.63	1.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]	0.63	[illegible]
MANU	20.50	8.50	MANUGISTICS GROUP INC	11.25	-1.25	9.6
MAPS	60.00	10.00	MAPINFO CORP	[illegible]	[illegible]	1.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MSFT	109.25	60.25	MICROSOFT CORP	[illegible]	[illegible]	0.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.7

Exch	52-Week Range			Apr. 4 Close	Wk Net Change	Wk Pct Change
PMTC	40.25	17.00	PARAMETRIC TECHNOLOGY (H)	37.75	-1.25	-3.3
PARQ	15.75	6.63	PARCPLACE SYSTEMS INC	9.25	0.50	9.7
PSFT	60.50	19.63	PEOPLESOFT (H)	57.88	-3.38	5.9
PTEC	16.13	6.75	PHOENIX TECHNOLOGIES	14.00	0.00	0.0
PSQL	16.00	3.19	PLATINUM SOFTWARE	8.38	-0.25	-3.5
PLAT	38.00	11.25	PLATINUM TECHNOLOGY	14.75	-0.38	-2.5
PRGS	38.00	14.75	PROGRESS SOFTWARE CORP	15.88	0.88	5.8
RNBO	26.75	15.13	RAINBOW TECHNOLOGIES INC.	17.75	0.00	0.0
ROSS	7.75	2.19	ROSS SYSTEMS	6.13	-0.50	15.8
SCOC	14.31	5.50	SCO INC.	7.00	0.63	9.8
SDTI	67.50	15.50	SECURITY DYNAMICS TECH	49.75	-3.50	-6.6
SKEY	51.75	13.38	SOFTKEY INTERNATIONAL INC.	22.00	1.38	8.7
SPCO	5.13	2.19	SOFTWARE PUBLISHING CORP.	3.00	0.13	4.3
SQAX	39.25	16.00	SQA INC (H)	39.25	2.00	7.1
SOTA	14.88	6.63	STATE OF THE ART	12.50	0.50	4.2
SSW	75.13	32.88	STERLING SOFTWARE INC (H)	76.25	3.50	4.9
SORC	36.38	8.38	SERUCT. DYNAMICS RESEARCH (H)	35.69	2.69	8.0
SYBS	39.25	19.88	SYBASE INC.	24.75	2.00	8.8
SYMC	33.25	9.88	SYMANTEC CORP	12.13	-0.63	-4.9
SMPS	38.50	23.00	SYNOPSYS	30.75	-1.25	3.9
SSAX	30.63	12.63	SYSTEM SOFTWARE ASSOC.	22.75	-2.00	-8.1
SYSF	18.13	8.50	SYSTEMSOFT CORP	17.00	0.88	5.4
TRUV	18.13	3.88	TRUEVISION CORP	8.00	0.75	10.3
VIEW	15.13	8.38	VIEWLOGIC SYSTEMS	12.25	1.29	11.8
VMRK	21.50	5.75	VMARK SOFTWARE INC.	7.50	0.31	4.3
WALK	11.63	4.63	WALKER INTERACTIVE SYSTEMS	11.63	1.63	16.3
WALL	46.50	13.00	WALL DATA INC	15.88	0.13	0.8
WANG	25.38	12.38	WANG LABORATORIES INC.	24.88	1.25	5.3
[illegible]						
AMER	60.00	16.75	AMERICA ON LINE	54.75	1.88	3.3
NETC	91.50	19.00	NETCOM ON-LINE	24.63	0.50	2.3
NSCP	87.00	22.88	NETSCAPE COMM. CORP	85.63	3.13	3.8
PSIX	39.00	8.75	PSINET	9.38	-0.38	-3.8
QDEK	39.50	3.50	QUARTERDECK CORP	13.44	1.00	-7.3
SPYG	61.00	13.25	SPYGLASS INC.	20.88	-0.75	-3.5
UUNT	98.75	21.75	UUNET TECH.	29.00	3.50	13.7
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AMD	39.25	16.13	ADVANCED MICRO DEVICES	17.25	-0.75	-1.0
ADI	30.13	16.63	ANALOG DEVICES INC	27.13	-0.63	2.3
CHPS	15.88	7.25	CHIPS AND TECHNOLOGIES	8.00	0.13	1.6
CRUS	81.13	16.88	CIRRUS LOGIC	17.88	-0.13	-0.7
CY	27.75	10.00	CYPRESS SEMICONDUCTOR CORP.	11.25	-0.13	-1.1
CYRIX	49.75	18.25	CYRIX	23.50	1.00	-4.1
INTC	78.38	42.25	INTEL CORP	59.25	7.25	3.9
LSI	62.50	22.50	LSI LOGIC CORP	28.63	1.88	7.0
LSCC	43.00	23.00	LATTICE SEMICONDUCTOR	30.63	2.38	8.4
MCRL	32.50	12.50	MICREL SEMICONDUCTOR INC.	14.50	-0.50	-3.3
MU	94.75	27.50	MICRON TECHNOLOGY	91.00	-0.88	-2.7
MOT	82.50	44.75	MOTOROLA INC.	51.75	1.38	-2.6
NSM	33.63	13.63	NATIONAL SEMICONDUCTOR (L)	14.00	0.00	0.0
SERA	28.75	9.75	SIGMA SEMICONDUCTOR	19.75	0.38	1.9
TXN	83.75	42.75	TEXAS INSTRUMENTS	50.88	-0.38	-0.7
VLSI	39.13	10.75	VLSI TECHNOLOGY	13.38	0.75	5.9
WWTK	8.00	1.25	WINTEK	1.66	-0.10	-13.5
WDC	22.13	13.38	WESTERN DIGITAL CORP.	18.50	0.25	1.3
XLNX	55.50	20.75	XILINX	33.50	1.13	3.5
ZLG	54.13	28.50	ZILOG INC.	34.88	1.00	1.0
[illegible]						
APCC	25.88	7.00	AMERICAN POWER CONVERSION	10.13	0.00	0.0
ADPT	46.38	39.25	ADAPTEC INC.	49.25	-0.13	-0.9
CBER	13.13	4.25	CAMBER CORP.	5.75	-0.38	-6.1
CGN	7.25	2.50	COGNITRONICS CORP	4.44	0.25	6.0
CREAF	34.13	5.75	CREATIVE TECHNOLOGIES INC. (L)	6.50	0.31	5.1
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DTM	9.38	6.13	DATARAM CORP	4.63	0.38	8.8
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EMLX	26.50	6.38	EMULEX CORP.	10.00	-0.38	-2.6
ESCC	25.25	13.00	EVANS AND SUTHERLAND	24.25	1.25	5.4
EXBT	17.63	10.00	EXABYTE	14.13	0.88	0.0
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IOMG	32.63	2.38	IOMEGA CORP. (H)	32.63	6.25	23.7
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STX	31.75	17.88	STORAGE TECHNOLOGY	25.13	-0.75	-2.9
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XRX	144.63	109.38	XEROX CORP	128.75	1.63	1.3
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MICA	15.00	7.25	MICROAGE INC	10.50	0.13	1.2
PAYX	62.50	28.75	PAYCHEX	58.50	2.75	4.7
PMS	54.25	42.63	POLICY MANAGEMENT SYS.	45.25	0.50	1.1
REY	45.25	29.88	REYNOLDS AND REYNOLDS (H)	45.25	4.75	10.4
SEN	24.50	[illegible]	SENTRY	22.25	0.38	1.7
SHRD	68.25	37.00	SHARED MEDICAL SYSTEMS (H)	67.25	4.00	9.8
SSPE	26.50	14.88	SOFTWARE SPECTRUM INC	19.50	0.88	4.3
SNDT	[illegible]	[illegible]	SOMERSET DATA SYSTEMS	15.75	1.00	6.4

KEY (H) = New 52-week high reached in period (L) = New 52-week low reached in period

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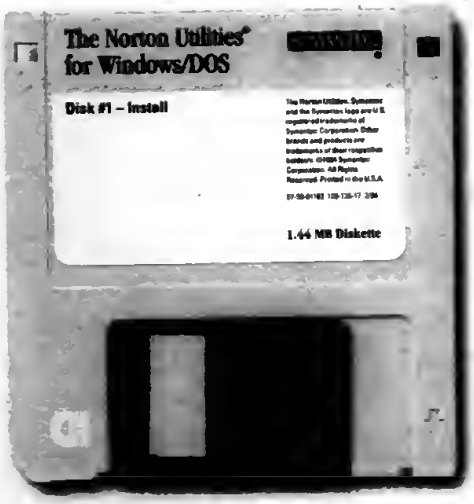

These disks are exactly the same, but somebody just paid $100,000 for the one on the right.

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Vendors will enhance monitoring products

Enhancements are on the way to help users of two popular network performance monitors, vendors disclosed last week at Networld/Interop '96.

Concord Communications, Inc. in Marlboro, Mass., in the next six weeks will add features and integrate its Network Health tools with Cabletron Systems, Inc.'s Spectrum network management platform. Concord will also offer a World Wide Web interface for remote operation and modules that support specific telecommunications functions needed by carriers. Frontier Software Development, Inc. in Chelmsford, Mass., this summer will offer playback capability in its NetScout Manager. The addition of the SQL database to the tool will let users apply different analysis tools to collected data. — *Patrick Dryden*

Collabra

CONTINUED FROM PAGE 1

taking code from one product and putting it into the other. We are building features that Share has into the Netscape software, using Share as a model," he said.

Former Collabra CEO Eric Hahn, who is Netscape's senior vice president of enterprise technology, vows to keep any worried Collabra users in mind.

"All too often, mergers happen and resulting products don't meet customer needs," Hahn said.

"I watched what happened when Lotus bought CC:Mail [Hahn's former company]. We don't want to repeat that."

Continued support

Netscape maintains that it will continue to support Collabra's original LAN-based product line. But Teekema said he and other customers fear the support won't last long. "If this means the end of the separate Collabra product, we'll abandon it," Teekema said. He doesn't want Netscape to try to force use of the Internet upon him, he added.

"We bought Collabra because it fits with our [Windows NT] infrastructure. We're not going to change our whole architecture for it," he said. The Natick, Mass.-based company is one of the largest Share sites, with a 2,000-user license.

Some items presented at the meeting went over well with users, such as the promise of free migration tools to help move from Share to Netscape products. But other ideas raised eyebrows. For example, Netscape's lack of a clear timetable for rolling out specific groupware features disturbed one user, who requested anonymity.

Netscape has good groupware ideas, but the products aren't out yet, she said. "You can't lead users by the nose with ideas. You have to give us something."

Hahn admitted not everyone liked what they heard. Some users noted "places where we got it right on — and they were vocal about where we have more work to do," he said.

The next major upgrade to Netscape's Navigator browser — Version 3.0 — will be an intermediate step to providing groupware functions, the company said. Navigator 3.0 users will be able to access Share-based discussion groups, for example. Netscape in the second half of this year will ship Web servers outfitted with work-sharing capabilities.

Navigate this

If Netscape wants to unite Microsoft Exchange and Lotus Notes with Web-based groupware, it must do the following:

- Build support for Collabra Share document-sharing features into the Navigator 3.0 browser by midyear
- Work with Internet standards bodies to extend Net News Transport Protocol so it can support full-text searching and other new features
- Build migration tools to help users leap from LAN-based Share to groupware that uses Internet Protocols

Check out our browser review. See page 68.

HP Unix

CONTINUED FROM PAGE 1

stations eventually will be able to handle PA-8000 upgrades, company officials confirmed.

The 180-MHz chip is expected to ship as an upgrade for HP's K-class midrange servers during the third quarter. It will also become available this year for the low-end D-class and high-end T-class families. HP in the fall is expected to announce plans for building new server boxes built around the PA-8000.

Little room to move

Analysts said HP's existing server lineup is less flexible than rival 64-bit models that Sun Microsystems, Inc. plans to introduce next week [CW, April 1].

The K-class, HP's big seller, stops at four processors and then requires users to jump up to the T-class. Sun's Ultra Enterprise machines are expected to use common components up and down the 30-processor line.

"There are some discontinuities in HP's line, and that could hurt them," said Rich Partridge, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

The performance boost promised by HP is especially needed on the workstation side, where it has fallen off the throughput pace (see chart).

"HP's kind of lost some of its luster as a leader in workstations," said Roo Nelson, a computing team leader at Los Alamos National Laboratory's Neutron Science Center in New Mexico.

The throughput of the J models that HP introduced last June "was not our idea of a good time," Nelson said.

The Neutron unit bought several J200 systems because HP promised it would support a board upgrade to the PA-8000. "We need it," Nelson said, adding that some of the lab's calculations take 24 hours to run on the J200s and tip low-end 735s.

HP's workstation market share dropped last year after it rose steadily in earlier years, according to preliminary unit shipment figures from Dataquest, Inc. in San Jose, Calif.

"It's been a long time since HP made a high-end announcement that really mattered," said Andrew Feit, an analyst at Dataquest. The C-class desktops, which debuted last November, were overshadowed by faster and cheaper 64-bit boxes that Sun introduced at the same time.

Sizing up the competition

Without the PA-8000, HP's current midrange workstations trail rival systems on performance*

Vendor	Model	Base price	SPECint95
Sun Microsystems	Ultra 1 Model 140	$16,495	4.66
Digital	AlphaStation 255/300	$13,845	4.51
IBM	RS/6000 43P-133	$11,270	4.45
Silicon Graphics	Indy R5000SC	$13,995	4.1
Hewlett-Packard	HP 9000 C-100	$17,000	3.67

*Generally configured with 17-in. monitor, 32M bytes of memory and 1G byte of disk space

Source: Dataquest, Inc., San Jose, Calif.

But the PA-8000 should put HP in a stronger position, according to Feit.

The new high-end workstation that will be available in limited quantities this month is targeted at compute- and graphics-intensive workloads, sources said. It will fit above the C and J models and will likely cost $35,000 or more, which would attract a relatively small audience, analysts said.

DEC's midrange AlphaServer

CONTINUED FROM PAGE 1

nology to the midrange space.

VLM is a 64-bit server technology that can substantially increase the amount of information stored in main memory. For instance, Digital's TurboLaser servers hold up to 14G bytes of memory, compared with most 32-bit systems that are limited to between 2M and 4M bytes of main memory.

Faster option

Applications run much faster when the data is stored in main memory instead of on disk drives, said Jonathan Eunice, an analyst at Illuminata, Inc. in Nashua, N.H.

"When you have gigabytes of main memory, suddenly your assumptions of what runs how fast change dramatically," Eunice said.

"It's kind of like a brute force method to achieve higher-speed throughput," added James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

Digital now supports VLM on only its Unix and OpenVMS operating systems. But Digital's impending Rawhide announcement pushes Windows NT support higher up the performance curve, said Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

Stopgap

Digital next month will plug a hole in its AlphaServer family with a midrange addition that will speed application performance and scale Windows NT much deeper in to the enterprise.

"The 4100 is basically going to be an upscale version of the 2100 with a much bigger system bus, higher-capacity backplane and improved I/O bandwidth," he said. This means the product will have substantially improved performance and throughput.

Starting prices are expected to be about $60,000, according to sources, but fully configured systems with large memory configurations will easily cross the $100,000 mark. AlphaServer 8200 systems start at about $125,000.

"The idea that you can get substantially better performance than a 2100 at a price less than the 8200 series sounds like a win, win, win," said Ronald Freed, MIS manager at Hatfield Quality Meats, Inc. in Hatfield, Pa. The company uses Digital's 2100 servers.

The symmetrical multiprocessing AlphaServer 4100 series will support up to four Alpha processors, and an entry-level system probably will be based on the 400-MHz chip, sources said.

The systems will feature 8G bytes of memory and more than 8T bytes of storage. It will also support OpenVMS and Digital Unix operating systems.

Sun's defunct offer for Apple now looks good

Charles Babcock

The Meta View

Apple has painted itself into a corner, and only a takeover can get it out.

Apple Computer's expected report next week of a $700 million quarterly loss and its declining stock price illustrate just how precarious its position is.

It was only two months ago that Apple turned up its nose at an offer of $33 per share from Sun Microsystems. Now, with its shares bobbing around $25, that offer doesn't look so bad.

Everybody expected Gilbert F. Amelio, chairman and CEO of Apple, to take a restructuring loss this quarter, and indeed he did. Restructuring represents about 25% of the $700 million.

But more than half the loss represents unsold Macintoshes and notebooks that are losing value as they sit in Apple warehouses. It's the latter fact that Wall Street analysts didn't expect, and that makes Apple's future such a compelling subject for diagnosis.

Along with the restructuring expense, for example, Apple's revenue declined 17%. Retail stores report that demand for Macintoshes in the home and school markets remains strong, which indicates to me that many businesses are finally turning their backs on the Macintosh and ruling it out of purchase decisions.

Apple has painted itself into a corner, and only a takeover can get it out. For too long, it played off its name and the Macintosh's superiority to collect higher prices. In the process, it ignored the economics of the marketplace and kept the Macintosh operating system proprietary and limited customer choices.

This strategy was OK as long as the Macintosh remained clearly differentiated, but the Windows/Intel PCs slowly crept up on the Macintosh's lead in ease of use. Apple then took off on a hapless pursuit of market share, slashing prices but losing money and market share in the process. It's down to 7.4% of the world market in terms of units vs. 9.4% two years ago, according to International Data Corp. in Framingham, Mass.

Amelio, in internal discussions, now is raising the possibility of going back to higher prices, to being the Maglite — the better built flashlight — of computers.

This is a wish that tries to defy gravity. I know of products such as Japanese cars that started out as economy models and moved up to the luxury class. I know of luxury products that have used the cachet of their name to reach a mass market. But I don't know of any products that descended from Olympian heights to the trenches, then elevated themselves again. To charge superior prices, you have to produce what is perceived as a superior product.

Apple no longer enjoys clear superiority over a Windows 95 or Windows NT platform. And how will Apple regain leadership when its research and development funds are drying up amid declining revenue?

There are times when companies can levitate themselves, skimming capital off the sales of existing products to develop better ones, and there are times when they are trapped inside declining revenue. For Apple to escape its closing circle, Amelio will have to be more than a turnaround artist. He will have to be a magician.

From this perspective, Sun acquiring Apple made sense. Sun would have been able to invest in making the Macintosh operating system a portable system, available on SPARC and other Unix-oriented hardware.

With luck, Sun would have found a way to put the Macintosh interface on a new, lower-cost home computer, which would become a common Internet client.

Macintosh software developers would have found they were participating in an expanding market, instead of a declining one, and gone back to work to fashion programs that took advantage of the new circumstance.

There are many difficulties with such a takeover scenario — the question of what would happen to the PowerPC hardware is just one — but it would have allied Apple's ease of use with the technical proficiency of the Unix community. It would have given a leading Unix vendor a user-friendly front end with which to gain a desktop presence. Possibly — just possibly — such an alliance would have lived to fight Wintel another day.

• • •

Did you know?: **Bill Hewlett** and **David Packard** named their company with a coin toss on Jan. 1, 1939. Hewlett won the toss, and his name was used first for Hewlett-Packard Co. Two years later, Packard won a different kind of lottery when Hewlett was drafted into the Army Signal Corps; and he was left to run the company. Packard died March 26 at the age of 83.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Don't be a 'luser' . . .

One programmer recently told us about a user who had some trouble booting up his PC. A dialog box appeared that said, "Press any key to continue." The user called the help desk. "But I don't see the 'any' key," he complained. Participants on Usenet's alt.sysadmin.recovery like to call such people "lusers." IS pros use the Internet newsgroup to vent frustrations. One recent thread, titled "I hate lusers," asked about the memorable ways in which computer rooms have been brought down. It included everything from clueless landlords who shut off the electricity to 60 pounds of cable that fell on fragile computer cases.

CA objectifies Unicenter database

Computer Associates plans to replace the relational database used to run its Unicenter systems management software with an object-oriented database by year's end. Unicenter, which runs on CA's Ingres environment, will run on CA's forthcoming Jasmine object database, according to Charles B. Wang, chairman and CEO of the Islandia, N.Y.-based firm. CA's Jasmine will be generally available in the third quarter this year.

Cisco bulks up switch line

Cisco Systems this week will pump up its Catalyst switch line with the 2900, a low-end 10/100M bit/sec. hub and a 10/100 module for its larger Catalyst 5000 switch, according to sources briefed by the vendor. On the router side, Cisco will announce Fast Ethernet (100Base-T) interfaces for its midrange 4500 and 4700 routers and its higher-end 7000 and top-of-the-line 7500 routers.

Acer to ship commercial PCs

Following the lead of Gateway 2000 — and more recently, Packard Bell — consumer PC maker Acer America is getting ready to dive in to the commercial PC arena, according to a source close to the company. Acer, which is among the Top 10 PC vendors in the world, plans to announce later this month a range of PCs, servers, peripherals and support services aimed at the business user.

Shore up those supports

Microsoft may be breathing a sigh of relief that the Exchange messaging software it released this week runs on Digital's Alpha servers. Sources say buildings at Microsoft's Redmond, Wash., headquarters are practically buckling under the weight of so many computers and servers (estimates are placed at up to 60,000 machines for 18,000 employees). Alpha servers, which can handle many more users at a time than Intel-based machines, could alleviate some of the clutter. But then again, maybe Bill Gates is the culprit, stashing his extra billions of dollars in cash in storerooms across the Microsoft campus.

And to keep track . . .

Of course you can keep up with all of Bill Gates' money by heading to http://www.webho.com/WealthClock, which provides an updated estimate of the Microsoft CEO's wealth based on company stock price and Gates' holdings. Unfortunately, says page creator Philip Greenspun, the WealthClock does not take into account Gates' other vast holdings in digital libraries, cars, houses, art treasures, small islands and so on.

A New Jersey company used mobile technology to make a killing at the recent NCAA basketball finals at the Meadowlands Arena. Aramark Corp., a food and souvenir vendor, made more than $800,000 over the weekend competition with a total of 2,400 credit-card transactions, 67% of which were done wirelessly. By using Cellular Digital Packet Data technology from Bell Atlantic Nynex Mobile, Aramark was able to send and receive credit-card information in about six seconds — faster than the typical land-line connection, which takes about 20 seconds. News editor Patricia Keefe doesn't care how you send news tips; just send them! She can be reached at (508) 820-8183 or at patricia_keefe@cw.com.

The 5th Wave by Rich Tennant

"Most of our product line is doing well, but the expanding touch pad on our PDA keeps opening unexpectedly."

Mike wants to upgrade his company to Lotus Notes Release 4.

If 2,352 people in 8 departments will use it, how many servers will Mike have to add?

a) 4 b) 8 c) 12

The correct answer is:
d) None of the above.

Boy, that was an easy one.

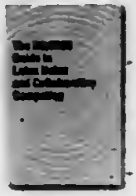
[Can your Notes server do this?] While Lotus Notes® Release 4 can be the answer to your collaborative computing prayers, it can also raise some important questions. Like how many servers will you need to handle the added users Notes™ Release 4 supports? Fortunately, there's a rather simple solution: the RS/6000™ Notes Server.

By consolidating your existing servers with the UNIX®-based RS/6000 server, you can take on more users without bringing in more servers. And, because the RS/6000 offers unsurpassed scalability, your business can grow with it, not out of it.

What's more, the RS/6000 Notes Server lets you manage your entire network from one easy-to-access location.

Of course, you won't be left to figure things out on your own. RS/6000 specialists will help you design a customized solution that will best meet your collaborative computing needs.

The RS/6000 Notes Server. Think of it as subtraction by addition.



How can the RS/6000 help simplify your move to Notes Release 4? For the answers, get our free booklet, "The RS/6000 Guide to Lotus Notes and Collaborative Computing." Call 1 800 IBM-3333, ext. FA230, or visit www.rs6000.ibm.com on the Net.

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